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THE
Savill Lecture
of the West End Hospital for Nervous Diseases
ON
MIGRAINE.

Delivered at the Royal Society of Medicine on July 3rd, 1924,

BY ARTHUR F. HURST, M.A., M.D. OXF., F.R.C.P.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL.

Thomas Dixon Savill wrote his admirable work on "Clinical Medicine" as a kind of protest against the tendency in modern text-books to bury the essential clincial features of disease under a mass of pathological speculation. It is therefore appropriate that in choosing the subject of migraine I have been led to do so by a desire to show how little scientific foundation there is for the greater part of the biochemical miasma in which the condition has in recent years become enshrouded, and to emphasise a few basic clinical facts, the realisation of which makes it possible to give complete, or almost complete, relief to a large majority of sufferers from migraine.

So far as the clinical picture of typical migraine is concerned, the main features were well recognised several hundred years ago. Aretæus of Cappadocia, in the second century A.D., was the first to distinguish migraine from other forms of headache by drawing attention to its unilateral and paroxysmal character. Cælius Aurelianus (400 A.D.) described some of the visual symptoms and Alexander Trallianus (600 A.D.) the disturbances in gastric function, but it was not until 1725 that Vater drew attention to the characteristic hemianopia, and 50 years later that Mirabeau, whilst in prison at Vincennes, wrote the first of the long series of graphic descriptions of the visual phenomena, for which the medical profession is indebted to lay victims of migraine. Dr. Edward Liveing, later the distinguished librarian of the Royal College of Physicians of London, collected all that was known of migraine in a remarkable volume published in 1872, and in the 50 years which have elapsed since then very little of importance has been added to our knowledge of its symptoms.

PATHOGENESIS.

I believe that there are two essential factors in the pathogenesis of migraine—one central, the other peripheral. The first is a constitutional and usually inherited predisposition. It does not depend upon any obvious structural abnormality of the brain, but upon a functional abnormality, something of the same nature as the functional abnormalities of the brain which are the essential factors in the pathogenesis of epilepsy and of asthma. Indeed, there appears to be a definite relationship between the functional abnormality underlying these three conditions, as they not infrequently coexist in the same family, and occasionally even in the same individual.

THE MIGRAINE STORM-CENTRE.

No satisfactory theory has ever been advanced as to the nature of the constitutional element in migraine, any more than it has been in epilepsy or asthma. Fifty years ago Liveing in his book "On Megrim and Sick-Headache," which is now, as it was then, the standard work on the subject, suggested that an attack of migraine should be regarded as a kind of "nerve-storm." The term is a useful one, even if it conveys no precise scientific meaning. For I do not think it is possible in the present state of our knowledge to do more than express the belief that migraine, epilepsy, and asthma depend upon a constitutional tendency of certain parts of the brain to become storm-centres under certain conditions. They only differ in the part of the brain concerned. In asthma it is obviously the part of the vagal nucleus which controls the constrictor and secretory fibres of the bronchi that is at fault. In epilepsy it is cortical, or, if more deeply seated, it is an area from which impulses to the cortex are discharged during an attack. The phenomena of migraine concern so many parts of the body that the cerebral localisation of the storm-centre upon which it depends is very difficult to define. The typical visual phenomena are due to stimulation followed by paralysis of an area in the occipital cortex; the rare aphasia and disturbances in the sensory and motor functions of the limbs are also no doubt cortical; the gastric and vasomotor symptoms must depend upon disturbances in the sympathetic nervous system, whilst the origin of the headache remains a complete mystery. Perhaps the storm-centre is somewhere at the base of the brain, from which impulses pass successively to the different parts concerned. This would explain why the exact order of events varies in different individuals, but remains fairly constant in each patient, and why in the same individual attacks vary greatly in the relative prominence of the successive phenomena, all of which do not necessarily recur in every attack.

About 15 years ago I first defined asthma as a condition in which spasm, excessive secretion, and congestion occur in the bronchi as a result of paroxysmal discharges from an abnormally irritable centre in the medulla brought about by chemical, psychical, and peripheral stimuli, and I have seen no reason to modify this conception of the disease as a result of increased experience. The abnormally irritable centre is the only constant factor. The same is perhaps true in epilepsy, as attacks may certainly be brought about by chemical, reflex, and psychical stimuli, though in the majority of attacks it is impossible to recognise the nature of the exciting cause. In migraine a biochemical factor has frequently been suggested, though there is little agreement as to its nature. Nobody, so far as I know, has ever regarded migraine as a psychoneurosis, though expectation is an occasional factor in many individuals subject to migraine. Various peripheral causes have been regarded as playing a part in the pathogenesis of migraine, and my own experience points to an ocular origin as of fundamental importance in a large majority, if not in all, cases. These various factors must now be considered in greater detail.

I. BIOCHEMICAL FACTORS.

A perusal of the recent literature on migraine leaves the impression that most authorities hope to find a way of salvation in modern biochemical research. There is much talk about toxic idiopathies and how they may be discovered by cutaneous reactions, and in this connexion the close relationship of migraine to asthma is regarded as a hopeful sign. Migraine is also one of the many conditions which have been regarded during the last few years as due to disturbances in the glands of internal secretion. Intestinal toxæmia following stasis in the ileum or the colon has become a widely accepted explanation of migraine, and attempts have been made to cure the condition by such heroic measures as the division of adhesions, short-circuiting operations, and even colectomy. More recently the liver has been incriminated, especially by French physicians, and now that a distinguished surgeon recommends splenectomy for recurrent biliary infection, we may expect the spleen to be added to the already somewhat bewildering list of organs in which the migraine-producing poison may arise.

It is interesting to note that most of these theories are nothing more than revivals in modern dress of the ancient humoral conception of disease. Thirteen hundred years ago Alexander Trallianus ascribed migraine to a superfluity of bilious humour, for which he recommended "aloes and scammony and other drugs which purge off bile without heating much."

chronic intestinal stasis, and the patients were wearing uncomfortable abdominal supports and dosing themselves with aperients, and many had had courses of Plombières douching. But both diagnoses had been made without bearing in mind how great are the normal variations. A pelvic cæcum and a greater curvature and transverse colon below the belt are, like a movable kidney, no more signs of disease than a crooked nose. They are frequently found in the healthy and vigorous, and the kinks and secondary adhesions, to which they are sometimes said to give rise, are almost always figments of the imagination. Many of the severest cases of intestinal toxæmia I have seen were in people who were poisoning themselves with aperients and with the toxins produced and absorbed in excess from their colon as a result of its contents having been rendered too fluid. With a return to a healthy degree of constipation their symptoms generally vanished.

I have no doubt that the tendency to migraine may be greatly increased by the artificial diarrhœa produced in an attempt to overcome a hypothetical poisoning from intestinal stasis, which either does not exist at all or which can be completely relieved by very little more than proper attention to the normal hygiene of the bowels. But even this intestinal toxæmia is not the cause of migraine; it is simply an accessory factor, which aggravates the liability to attacks by its deleterious effect on the general health. Thus a lady, 47 years of age, consulted me four and a half years ago for severe attacks of unilateral headache, occurring at least once a fortnight. They lasted for about 12 hours and were always accompanied by hemianopia and followed by nausea and vomiting. She had had much treatment for supposed "colitis," which was regarded as the cause of the migraine, though the latter began when she was 11 and the intestinal symptoms were of comparatively recent onset. Correction of her errors of refraction resulted in the immediate complete disappearance of her migraine, which has not recurred, but four years later she again consulted me for the so-called "colitis," which was simply the result of injudicious purging. She has now been taught to allow her bowels to look after themselves, with the result that during the last five months she has been completely fit in every way.

II. Psychical Factors.

A psychical stimulus is an occasional but comparatively unimportant factor. Sir John Herschell, one of the numerous astronomers who have suffered from migraine, found that he could induce attacks by picturing in his mind the visual phenomena which usually accompanied them. I have known a patient get an attack on seeing a wallpaper with a zigzag pattern which reminded her of her migraine, and the remarkable periodicity in individuals, who get attacks every Sunday morning or the first day of every menstrual period, may be partly a result of expectation leading to the suggestion of an attack, as well as to the fatigue of the week or the effect of the disturbance in the internal secretions of the body which recur at monthly intervals in women. As in asthma and in epilepsy, expectation and suggestion can only cause an attack in an individual who has the essential irritable centre in his brain; without that no amount of suggestion could conceivably give rise to a true attack of asthma, epilepsy, or migraine. In the case of asthma and epilepsy nothing more than hysterical tachypnœa and hysterical convulsions respectively would result in the absence of the essential constitutional factor, but I know of no corresponding hysterical imitation of migraine.

III. Reflex Factors: The Ocular Origin of Migraine.

I come now to the consideration of peripheral stimuli as possible causes of an attack of migraine. In the case of asthma irritation of the nasal and bronchial mucous membrane and distension of the stomach and the rectum are common reflex causes of attacks. Peripheral irritation from various parts of the body is occasionally an exciting cause of epileptic attacks, especially in children. In migraine there is only one place from which a similar exciting stimulus arises, but it is of fundamental importance, as I believe that in its absence no attacks can occur, though the irritable centre in the brain is a permanent condition, which can even be inherited from an individual whose father or mother had migraine, but who never has an attack himself, because the exciting reflex cause never comes into operation.

In 1828 Piorry drew attention to the fact that cases of migraine occur most frequently in people who work in ill-lighted rooms, read and write much, and lead a sedentary life in which their attention is constantly fixed on objects badly lighted or of very small size. He concluded that the malady or, at least, the variety associated with visual phenomena was due to irritation of the optic nerves occasioned by eye-strain.

After a long period of neglect Piorry's views were revived from time to time, and in recent years particularly by Ernest Clarke in England and Gould in America. On the other hand, most modern writers on migraine ignore the ocular factor entirely or consider it of quite minor importance, and very few give it the prominence which I am now convinced it ought to assume.

Being interested both in neurology and in digestive disorders, I have had the opportunity of seeing a very considerable number of cases of migraine. For a short time in 1915, before I went abroad on military service, I had the good fortune of working in association with Lieut.-Colonel R. H. Elliot, and during the last five years he has investigated all my cases. I can honestly say that my views with regard to prognosis have entirely altered since I have had the advantage of his help. All my cases before the war had their eyes examined, and they all had the usual medicinal and general treatment. But though many improved, few were cured. Now the improvement is almost always considerable, and complete cure is common. I am indebted to him for the following brief details as to the nature of the ocular defects which he finds are commonly associated with migraine.

Hyperopic astigmatism, especially when associated with latent hyperopia, is the most common error of refraction. Astigmatism, which is generally compound, is very rarely entirely absent. Very small errors are quite sufficient to give rise to migraine, especially in highly-strung clever people with a very irritable migraine storm-centre. For this reason the most accurate possible correction of every error is required. A well-known neurologist has recently written that "errors of refraction should be adjusted only if they are important." But even the smallest errors are, I am certain, always important, and to correct only gross errors has prevented him, like many other physicians and ophthalmologists, from realising the enormous benefit which follows sufficiently accurate ophthalmological treatment. Muscle balance defect may by itself cause migraine, though much more frequently it is associated with errors in refraction. Hyperphoria, or insufficiency of the superior and inferior recti, is the most important, and esophoria, or insufficiency of the external recti, is sometimes a factor; but exophoria, or insufficiency of the internal recti, is of little or no importance. Muscle balance should be accurately tested in every case both for near and distant vision, as a quite different correction may be required for each. It is this cause of eye-strain which is most frequently missed in the ocular treatment of patients with migraine, though small errors of refraction, especially in the form of astigmatism, are also too often neglected.

Diagnosis.

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The tenth-century Arabian physician, Serapion, differed little from those who to-day look upon the intestine as the origin of most of the ills of humanity, as he too believed that migraine was due to the movement of pernicious vapours from the alimentary canal to the pericranium, whilst Graaf of Leyden in his treatise, "De Clysteribus," published in 1688, wrote that "clysters relieve headaches by ridding the intestines of excremental humours, the vapour of which can rise to the brain." About the same time that great Oxford physician, Thomas Willis, added the spleen to the liver, stomach, and intestines as a source of the peccant humour which causes migraine.

(*a*) *Anaphylaxis: Toxic Idiopathies.*

The theory that migraine is a kind of anaphylactic phenomenon similar to asthma and dependent on a toxic idiopathy—a hyper-sensitiveness to certain proteins—is certainly attractive and requires consideration. I do not know whether anybody claims to have obtained positive cutaneous reactions to proteins in as large a proportion of cases of migraine as Walker appears to obtain in asthma. I heard so much about his work when I was in America in 1919 that I brought back a set of his dried proteins in order to investigate the question myself. But although we have systematically tested the cutaneous reactions in every case of asthma both at Guy's Hospital and New Lodge Clinic with the dried American proteins, and more recently with one or other of the liquid preparations which have now been put on the market by several British firms, we have hardly ever gained any information of the slightest value. The largest wheals I have seen were in a man in whom it had already been discovered that the proteins of goose feathers and tea gave big reactions. But we found that the solvent of the proteins gave an equally great reaction, the patient's skin being apparently unusually sensitive to the slightest irritation. I believe most of the extravagant claims, which have been made by the very small number of observers in England who believe they have confirmed Walker's work, are due to a similar fallacy, for the physician who had examined this patient has written that he does not think it necessary to do controls with the solvent of his proteins as standards for comparison with his supposed positive reactions. Needless to say, no improvement in the patient's condition had followed giving up tea or the use of a kapok pillow. Other treatment at the Clinic resulted, however, in the complete disappearance of his asthma; a goose-feather pillow was then substituted without his knowledge for his own kapok pillow, and he had a perfect night with no trace of asthma.

True cutaneous reactions are very commonly obtained with pollens in hay fever, but I quite agree with Freeman, who was the first to use this method of investigation, that it does not give any reliable information in more than 5 per cent. of asthmatics, and in our experience positive results are never obtained in migraine.

In spite of the small value of cutaneous tests in asthma, I believe that a toxic idiopathy is none the less very often present in addition to the irritable bronchial centre, the inherited and constitutional abnormality which is the only essential factor. But I have not been able to obtain the slightest clinical evidence that a toxic idiopathy is ever an exciting cause of attacks of migraine.

(*b*) *Internal Secretions.*

It is not surprising that the endocrinologist—I apologise for the term, but it is not my invention—regards migraine as coming within his sphere of action. The author of the article on migraine in a large international system of medicine, published since the war, recommends treatment by the oral administration of pituitary gland, to which may be added suprarenal gland and in some cases extract of corpus luteum, testicles, and pancreas. Such multi-glandular therapy has as much scientific basis for it as the electuary with which, in 1668, Riverius, physician to the King of France, cured "a choice virgin, Margaret de Varanda," of her migraine; it consisted of conserve of wormwood and maidenhair, elecampane roots, salt of tamarisk, magistry of tartar, and his "specifick aperitive powder."

Though most of what has been written on the connexion between the internally secreting glands and migraine is entirely speculative, there is no doubt that many women regularly have attacks immediately before or during the first day of each period, as was pointed out 150 years ago by John Fordyce, himself a sufferer, and the first English author to write a monograph on hemicrania. In such cases the attacks may completely cease during pregnancy, and permanent recovery may occur at the menopause. This must clearly be due to some endocrine activity connected with menstruation, which renders the storm-centre in the brain particularly sensitive at these times. But its exact nature is quite unknown.

(*c*) *Uric Acid.*

This short review of possible biochemical factors would indeed be incomplete if I did not refer to the uric acid theory of Alexander Haig. It is quite clear from the writings of John Fordyce, Sir Henry Holland, and Parry of Bath, who described exophthalmic goitre ten years before Graves and 15 years before Basedow, that gout and migraine, like gout and asthma, were often associated together, and this was still true in the gouty days of Trousseau. But, unfortunately, the disappearance of gout in England does not appear to have led to any diminution in the frequency of either migraine or asthma.

There was never any scientific basis for Haig's theory. I well remember seeing an outline drawing of a man, with the left half of his body chalked blue, which had been given to a relative of mine who suffered from left-sided hemicrania. He had been told that the capillary circulation of the part marked blue had been found to be sluggish and that this was due to excess of uric acid, which was also the cause of his migraine. It is curious to find in many of the most recent articles on the subject that a theory which has so little evidence in its support is still to some extent accepted, as a purin-free diet is often recommended, though an extensive trial has convinced me that no benefit resulted from this somewhat irksome treatment.

(*d*) *Gastro-intestinal Toxæmia.*

The majority of private cases of migraine I have seen since the war have been sent to me in the hope that I could find some metabolic disorder or some evidence of chronic toxæmia, the relief of which might cure their migraine. I must add that in at least one-half of the cases it had not previously been recognised that the condition from which the patient was suffering was migraine. Every case has been thoroughly investigated, but in no single instance have we found anything supporting the theory that migraine depends wholly or in part upon any form of gastro-intestinal toxæmia or metabolic disorder. Between the attacks gastric secretion is normal, the stools show no signs of deficient digestion or absorption, the urine is normal, and tests for estimating the functional capacity of the liver and kidneys show no deficiency. The stomach empties itself in the normal time, there is no ileal stasis, and there is no pathological delay in the passage through the colon. I have never found any justification for the view propounded by a recent writer in the *British Medical Journal* that migraine is due to recurrent attacks of dilatation of the stomach, as in no single case have we found any abnormality of the kind, and the author brings forward no evidence in support of his theory.

In some cases previous examinations with the X rays had led to a diagnosis of visceroptosis and chronic intestinal stasis, and the patients were wearing uncomfortable abdominal supports and dosing themselves with aperients, and many had had courses of Plombières douching. But both diagnoses had been made without bearing in mind how great are the normal variations. A pelvic cæcum and a greater curvature and transverse colon below the belt are, like a movable kidney, no more signs of disease than a crooked nose. They are frequently found in the healthy and vigorous, and the kinks and secondary adhesions, to which they are sometimes said to give rise, are almost always figments of the imagination. Many of the severest cases of intestinal toxæmia I have seen were in people who were poisoning themselves with aperients and with the toxins produced and absorbed in excess from their colon as a result of its contents having been rendered too fluid. With a return to a healthy degree of constipation their symptoms generally vanished.

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III. REFLEX FACTORS: THE OCULAR ORIGIN OF MIGRAINE.

I come now to the consideration of peripheral stimuli as possible causes of an attack of migraine. In the case of asthma irritation of the nasal and bronchial mucous membrane and distension of the stomach and the rectum are common reflex causes of attacks. Peripheral irritation from various parts of the body is occasionally an exciting cause of epileptic attacks, especially in children. In migraine there is only one place from which a similar exciting stimulus arises, but it is of fundamental importance, as I believe that in its absence no attacks can occur, though the irritable centre in the brain is a permanent condition, which can even be inherited from an individual whose father or mother had migraine, but who never has an attack himself, because the exciting reflex cause never comes into operation.

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After a long period of neglect Piorry's views were revived from time to time, and in recent years particularly by Ernest Clarke in England and Gould in America. On the other hand, most modern writers on migraine ignore the ocular factor entirely or consider it of quite minor importance, and very few give it the prominence which I am now convinced it ought to assume.

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Diagnosis.

A typical attack of migraine is unmistakable. A paroxysmal attack of unilateral headache, preceded by visual disturbances and followed by nausea and vomiting, could hardly be due to anything else. But it must be remembered that the attacks vary greatly in different individuals, and even in the same individual. The visual phenomena are not often present in the remarkable forms, which have become classical as a result of the illustrated descriptions published by various distinguished sufferers. They may, indeed, be so slight that the patient does not mention them in describing his headaches and other symptoms, unless specially asked whether his sight is affected in his attacks. The headache, too, though generally the most prominent symptom, may be quite slight when the visual phenomena are most severe. Strictly speaking, a headache which is not unilateral ought not to be called by the English word megrim or the French migraine, which are simply mediæval corruptions of the Greek ἡμικρανία, or half-headache, but it is not uncommon for the other symptoms to be present in a quite characteristic form with a bilateral headache. It is true, however, that even when the whole head is affected, the pain is generally more severe on one side than the other, at any rate in some attacks. In rare cases neither nausea nor vomiting occurs; more commonly nausea and vomiting are such prominent symptoms that the patient makes light of everything else.

A great variety of other symptoms may occur with some or other of the three chief symptoms, or anomalous attacks may replace some of the typical migraine attacks. Thus disturbances in sensation and spasms or paresis may affect an arm or leg or one side of the face and tongue, and aphasia may accompany other symptoms involving the right side. In one case recurrent hemiplegia, with exaggerated deep reflexes and an extensor plantar reflex, was the prominent symptom, and a cerebral tumour had been diagnosed when I first saw the patient. But he had long been subject to migraine, and the hemiplegia was always associated with ocular symptoms and with a headache affecting the opposite side. The attacks ceased completely with treatment of the associated eye-strain. In some cases the patient may become confused or even have a definite attack of amnesia.

I have seen many cases in which the gastric symptoms were so pronounced that a diagnosis of some organic abdominal disorder had been made. As a matter of fact, such symptoms are quite unlike those caused by any primary gastric disorder, though the attacks of nausea without pain, which may occur in cholecystitis, are sometimes almost indistinguishable from the gastric symptoms of migraine, and they may also be accompanied by headache. In most cases a diagnosis can only be made by a careful inquiry into the associated symptoms and after a thorough investigation has failed to reveal any evidence of infection of the gall-bladder.

So-called bilious attacks in children are most frequently due either to migraine or to appendicitis. In this case again a detailed description of the attacks and a careful abdominal examination when an attack is actually present can alone point the way to a correct diagnosis. There does not appear to be any very sharp distinction between these "bilious attacks" and so-called "cyclical vomiting" of children. Out of 52 cases of cyclical vomiting observed in the Children's Department at Guy's Hospital, in which Dr. Osman was able to obtain a reliable family history, in no less than 23 the mother, or less frequently the father or some other relation, suffered from migraine, and 12 of these 23 had themselves been subject to cyclical vomiting as children. Cyclical vomiting appears therefore to be often, if not always, the expression in children of that type of cerebral storm-centre which gives rise to migraine in adults. The exciting factors in children are still unknown, but Osman has clearly shown that eye-strain, which is of fundamental importance in adults, has nothing to do with cyclical vomiting in children.

It is not generally recognised in England, though Mathieu and other French authors have frequently drawn attention to the subject, that diarrhœa may replace vomiting in some cases of migraine. It seems to be an exact equivalent, as the headache and nausea disappear as quickly after the bowels have been well opened as they generally do after vomiting, and in such cases an enema may abort an attack in the same way that washing out the stomach often does in the more usual form of migraine.

I am quite sure that numerous cases of migraine are missed owing to the ordinary text-book on medicine describing the classical attacks of migraine with the fortification spectrum and hemianopia, the unilateral headache, and the nausea and vomiting, without pointing out how unusual such attacks are, and without mentioning the far more common varieties together with the frequent *formes frustes*. Many of my patients had had an abdominal operation performed for the removal of an appendix, or, what was a far more serious mistake, part of the colon had been fixed, short-circuited, or removed for some hypothetical ptosis, kink, or adhesion, as such treatment not only did no good but actually produced abdominal symptoms which had not been present before.

I would suggest that in every case in which attacks of nausea occur, with or without vomiting or diarrhœa, but without definite abdominal pain, the possibility of migraine should be considered, and the patient should be questioned as to any associated headache, visual or other nervous symptoms. The possibility of migraine should also be considered in every case of paroxysmal headache, even if it is not strictly unilateral.

It is, of course, important to avoid making the opposite mistake. Just as typical epileptic attacks may be the first symptom of a cerebral tumour, so may symptoms very suggestive of migraine be due to the same cause, the tumour in this case being in the occipital lobe. Less commonly migraine attacks may be the first indication of the onset of uræmia, but an ordinary clinical examination should prevent the possibility of mistake in such a case.

PROGNOSIS.

Like the other paroxysmal neuroses, the only cure of migraine is not to have it, though, unfortunately, even this "cure" is not absolute. The storm-centre gets out of practice as time goes on, though it does not entirely forget how to act its old part. If an epileptic has no fit for three years, he can safely reduce his bromide, but I doubt whether it is wise for him to give it up entirely, even after an additional two or three years of freedom. I knew a man who had asthma from the age of 8 to 14. His family then removed from Southampton to South Africa. At the age of 39, after serving in the South African war, he came to England on a visit and landed at Southampton. He had had no asthma for 25 years, but had a severe attack on the night of his arrival. He fled to London, where he at once recovered, and he had had no further return when he left again for South Africa some months later—this time from another port, the atmosphere of which had not for him the asthmagenic properties of Southampton. With migraine the case is similar, and the spectacles which have caused the attacks to cease should be constantly worn. As the deficiency in muscle-balance may vary from time to time occasional re-examinations are useful, so that corresponding alterations in the prisms can be made when necessary. After some years of freedom from attacks, if the general health is good and vision for ordinary purposes satisfactory, the spectacles can perhaps be worn less constantly. But if the individual gets over-fatigued or goes through a period of physical or mental stress, a relapse is likely to occur unless the slightest tendency to eye-strain is continuously prevented. Thus I have known an attack of migraine occur after an interval of four years in a woman, whose very frequent and severe attacks had been completely arrested by proper glasses after prolonged drug treatment had failed. She had given up using them for over a year, when a period of unusual physical fatigue, accompanied by much worry, brought on the relapse. She at once returned to the discarded spectacles, and no further attacks occurred.

In most cases attacks of migraine become less severe and less frequent with advancing years, and spontaneous cure is not uncommon after the age of 50.

TREATMENT.

The most important part of treatment is the prevention of eye-strain. My object in choosing migraine as the subject of my lecture to-day will be attained if I can persuade practitioners, physicians, and oculists, whose past experience has led them to doubt the truth of this statement, to put it to the test once more. The author of the best recent clinical account of migraine I have read, in one of the most popular text-books of medicine of the day, writes that "very undue prominence has been given to the importance of errors of refraction as causes of migraine," and that "the majority of the subjects of migraine have no such errors of refraction, nor has the correction of such errors ever cured migraine." Personally I have never yet seen a case in which eye-strain was not present, and I have only seen two in which its correction did not either cure the patient or lead to very considerable improvement, and most of my patients had had prolonged treatment of various kinds before I saw them; some, indeed, had taken for months or even years the bromide, gelsemium, strychnine, and nitro-glycerine mixture first recommended by Gowers, which the distinguished neurologist, whose article I have just quoted, regards as his sheet-anchor in the treatment of migraine. The reason why the importance of the ocular factor is not more widely accepted is that few oculists trouble to give the attention to a patient with migraine that he requires. It is no doubt easy to correct an ordinary case of myopia, hypermetropia, or even astigmatism at a single interview of 15 or 30 minutes. But it is quite impossible to do this for a patient with migraine, as the smallest errors of refraction and every disturbance in muscle-balance require correction with absolute accuracy. This cannot be done in a hurry. At least three examinations on different days are required, the second being with the aid of a cycloplegic, and the third, 72 hours later, when the effect of the drug has completely disappeared. Muscle-balance defects are particularly difficult to correct, as their effect on the individual varies in degree from day to day, and even in the course of a single day. They are felt more in the evening when the patient is tired than when he is fresh in the morning, and at the end of a tiring week than after a restful Sunday. Their effect may temporarily disappear as the result of a country holiday, especially if the eyes are not used at all for any kind of near work. On the other hand, the resulting symptoms are exaggerated by anything, such as an attack of influenza, which impairs the general health.

Another difficulty is that many sufferers from migraine, far from having weak sight, as Piorry believed, are particularly proud of the excellence of their vision. They are very unwilling to consult an oculist at all, and still less willing to wear the spectacles he prescribes. In women often, and sometimes even in men, vanity stands in the way of cure, as a patient not infrequently hesitates whether the constant wearing of a disfiguring pair of spectacles is not too great a price to pay even for the relief of migraine.

The effect of preventing ocular strain is generally felt at once. In many cases attacks, which had occurred at frequent intervals for many years, cease immediately—never to return. In other cases they disappear less dramatically, but none the less surely; the intervals between them become more prolonged and they become less severe in character. Occasionally they actually become more intense and frequent for a short period, as with severe errors of refraction and disturbances in binocular muscle-balance it may take some time for the patient to become accustomed to the new conditions and for the strained extrinsic and intrinsic muscles of his eyes to relax. It is then often necessary to begin with a partial correction, and only gradually increase it until it is complete. Lastly, it must be remembered that the first attempt to overcome the eye-strain may be unsuccessful, generally owing to the patient's difficulty in answering questions correctly. In such cases he should be re-examined after having used his glasses continuously for three months, when it is usually possible to make quite accurate corrections. But if the symptoms persist and the first oculist consulted can do no more, then the help of another, and, if necessary, of yet another and another should be sought for until the desired object is attained. The first case which drew my attention to the fundamental importance of eye-strain was that of a young woman, who had had every kind of treatment and whose eyes had been examined and prescribed for on many occasions by four distinguished oculists without benefit, when she finally consulted a fifth, who was fortunate enough to discover and correct some deficiency in muscle-balance which had been missed by his predecessors. The cure was complete, as in the seven years which have since elapsed there has only been a single attack, and this resulted from giving up the spectacles at a time when the patient's general health was impaired.

Whilst the ocular factor is being dealt with it is often necessary to give some drug treatment, which will help meanwhile to reduce the frequency of attacks. Though arsenic has been used in countless cases since it was first recommended for the purpose by Bright, I have never convinced myself that it is of the slightest use. Bromide in small doses, as originally recommended by Liveing, and later by Charcot and by Gowers, appears to help some patients, but it has no effect in migraine in the least comparable to that which it has in epilepsy. The addition of gelsemium, nitro-glycerine, and strychnine in the mixture recommended by Gowers has not seemed to me to be any more effective than bromide given by itself. The only other really useful drug is luminal, which was, I think, first recommended for migraine by Wilfred Harris. A dose must be chosen which is just insufficient to produce any unpleasant degree of sleepiness, and this must be taken regularly. It can be given at the same time as the bromide, and the dose of both drugs can be increased for a few days when past experience indicates that an attack is imminent, as, for example, just before menstruation. The inconvenience caused by a slight amount of mental dullness and general sleepiness for a day or two is infinitely less than that caused by an attack in cases of any severity. But if the ocular defects have been adequately dealt with, it is not likely that drugs of any kind will have to be taken for longer than a few weeks, and in many cases it is unnecessary to take any at all. In a small minority of cases, however, complete relief only occurs if the prevention of eye-strain is associated with continuous medicinal treatment.

When other causes of ill-health, such as anæmia, dental or pharyngeal sepsis, gastric or intestinal dyspepsia, are found, they, of course, require suitable treatment. But though this may improve the general health, and thus make the patient get over the effects of an attack more quickly or even sometimes reduce their number, it is of quite secondary importance, and, as I have already pointed out, in a considerable majority of cases there is nothing of the kind which calls for treatment.

On the other hand, my experience shows quite definitely that attempts to treat supposed intestinal toxæmia by aperients, other digestive or metabolic disorders by freak diets, and endocrine deficiencies by glandular preparations—though happily most of the latter are completely inert—aggravate the patient's general health without influencing his migraine, and tend at the same time to add to the troubles of the unhappy subject of this paroxysmal neurosis by making him a hypochondriacal sufferer from a variety of imaginary complaints.

TREATMENT OF THE ATTACK.

I have little to say about the attack; it should be our object to prevent it rather than to treat it. But it must be remembered that the attacks vary greatly in different individuals, and even in the same individual. The visual phenomena are not often present in the remarkable forms, which have become classical as a result of the illustrated descriptions published by various distinguished sufferers. They may, indeed, be so slight that the patient does not mention them in describing his headaches and other symptoms, unless specially asked whether his sight is affected in his attacks. The headache, too, though generally the most prominent symptom, may be quite slight when the visual phenomena are most severe. Strictly speaking, a headache which is not unilateral ought not to be called by the English word megrim or the French migraine, which are simply mediæval corruptions of the Greek ἡμικρανία, or half-headache, but it is not uncommon for the other symptoms to be present in a quite characteristic form with a bilateral headache. It is true, however, that even when the whole head is affected, the pain is generally more severe on one side than the other, at any rate in some attacks. In rare cases neither nausea nor vomiting occurs; more commonly nausea and vomiting are such prominent symptoms that the patient makes light of everything else.

A great variety of other symptoms may occur with some or other of the three chief symptoms, or anomalous attacks may replace some of the typical migraine attacks. Thus disturbances in sensation and spasms or paresis may affect an arm or leg or one side of the face and tongue, and aphasia may accompany other symptoms involving the right side. In one case recurrent hemiplegia, with exaggerated deep reflexes and an extensor plantar reflex, was the prominent symptom, and a cerebral tumour had been diagnosed when I first saw the patient. But he had long been subject to migraine, and the hemiplegia was always associated with ocular symptoms and with a headache affecting the opposite side. The attacks ceased completely with treatment of the associated eye-strain. In some cases the patient may become confused or even have a definite attack of amnesia.

I have seen many cases in which the gastric symptoms were so pronounced that a diagnosis of some organic abdominal disorder had been made. As a matter of fact, such symptoms are quite unlike those caused by any primary gastric disorder, though the attacks of nausea without pain, which may occur in cholecystitis, are sometimes almost indistinguishable from the gastric symptoms of migraine, and they may also be accompanied by headache. In most cases a diagnosis can only be made by a careful inquiry into the associated symptoms and after a thorough investigation has failed to reveal any evidence of infection of the gall-bladder.

So-called bilious attacks in children are most frequently due either to migraine or to appendicitis. In this case again a detailed description of the attacks and a careful abdominal examination when an attack is actually present can alone point the way to a correct diagnosis. There does not appear to be any very sharp distinction between these "bilious attacks" and so-called "cyclical vomiting" of children. Out of 52 cases of cyclical vomiting observed in the Children's Department at Guy's Hospital, in which Dr. Osman was able to obtain a reliable family history, in no less than 23 the mother, or less frequently the father or some other relation, suffered from migraine, and 12 of these 23 had themselves been subject to cyclical vomiting as children. Cyclical vomiting appears therefore to be often, if not always, the expression in children of that type of cerebral storm-centre which gives rise to migraine in adults. The exciting factors in children are still unknown, but Osman has clearly shown that eye-strain, which is of fundamental importance in adults, has nothing to do with cyclical vomiting in children.

It is not generally recognised in England, though Mathieu and other French authors have frequently drawn attention to the subject, that diarrhœa may replace vomiting in some cases of migraine. It seems to be an exact equivalent, as the headache and nausea disappear as quickly after the bowels have been well opened as they generally do after vomiting, and in such cases an enema may abort an attack in the same way that washing out the stomach often does in the more usual form of migraine.

I am quite sure that numerous cases of migraine are missed owing to the ordinary text-book on medicine describing the classical attacks of migraine with the fortification spectrum and hemianopia, the unilateral headache, and the nausea and vomiting, without pointing out how unusual such attacks are, and without mentioning the far more common varieties together with the frequent *formes frustes*. Many of my patients had had an abdominal operation performed for the removal of an appendix, or, what was a far more serious mistake, part of the colon had been fixed, short-circuited, or removed for some hypothetical ptosis, kink, or adhesion, as such treatment not only did no good but actually produced abdominal symptoms which had not been present before.

I would suggest that in every case in which attacks of nausea occur, with or without vomiting or diarrhœa, but without definite abdominal pain, the possibility of migraine should be considered, and the patient should be questioned as to any associated headache, visual or other nervous symptoms. The possibility of migraine should also be considered in every case of paroxysmal headache, even if it is not strictly unilateral.

It is, of course, important to avoid making the opposite mistake. Just as typical epileptic attacks may be the first symptom of a cerebral tumour, so may symptoms very suggestive of migraine be due to the same cause, the tumour in this case being in the occipital lobe. Less commonly migraine attacks may be the first indication of the onset of uræmia, but an ordinary clinical examination should prevent the possibility of mistake in such a case.

PROGNOSIS.

Like the other paroxysmal neuroses, the only cure of migraine is not to have it, though, unfortunately, even this "cure" is not absolute. The storm-centre gets out of practice as time goes on, though it does not entirely forget how to act its old part. If an epileptic has no fit for three years, he can safely reduce his bromide, but I doubt whether it is wise for him to give it up entirely, even after an additional two or three years of freedom. I knew a man who had asthma from the age of 8 to 14. His family then removed from Southampton to South Africa. At the age of 39, after serving in the South African war, he came to England on a visit and landed at Southampton. He had had no asthma for 25 years, but had a severe attack on the night of his arrival. He fled to London, where he at once recovered, and he had had no further return when he left again for South Africa some months later—this time from another port, the atmosphere of which had not for him the asthmagenic properties of Southampton. With migraine the case is similar, and the spectacles which have caused the attacks to cease should be constantly worn. As the deficiency in muscle-balance may vary from time to time occasional re-examinations are useful, so that corresponding alterations in the prisms can be made when necessary. After some years of freedom from attacks, if the general health is good and vision for ordinary purposes satisfactory, the spectacles can perhaps be worn less constantly. But if the individual gets over-fatigued or goes through a period of physical or mental stress, a relapse is likely to occur unless the slightest tendency to eye-strain is continuously prevented. Thus I have known an attack of migraine occur after an interval of four years in a woman, whose very frequent and severe attacks had been completely arrested by proper glasses after prolonged drug treatment had failed. She had given up using them for over a year, when a period of unusual physical fatigue, accompanied by much worry, brought on the relapse. She at once returned to the discarded spectacles, and no further attacks occurred.

for for this purpose, and, when this is deficient, aceto-acetic and hydroxybutyric acids, poisonous substances, may be produced with very definite ill-results.

It might be urged that by increasing the carbohydrate in the food, the digestion of sugar would be so increased as to flood the blood with glucose, producing a hyperglycæmia, as in diabetes, and a consequent glycosuria. In practice this does not occur. To produce such a hyperglycæmia, in any but a diabetic person, it is necessary to secure a very rapid absorption of sugar from the intestine, and actually, unless glucose itself be given by the mouth, it is almost impossible to do this. The digestion of starch is slow enough to secure a steady and prolonged absorption of glucose without great excess at any given moment.

From what has been said above it follows that, if to a normal diet you add further carbohydrate, you will tend to increase the patient's supply of energy, and you will thus tend to fatten him. At the same time, you are providing that form of energy which is most easily accessible, and the one which throws the least additional work on the internal organs of metabolism and excretion.

But here it must be noted that we may give a diet containing increased carbohydrate and at the same time reduce the content of protein, of fat, or of both. What effect will this produce? (*a*) According to the extent of the carbohydrate addition the energy value of the food will or will not be such as will tend to fatten the patient. (*b*) Work by the liver and kidneys will be appreciably diminished by reduction of the protein, and digestion in the alimentary canal will be more easily accomplished on the removal of fat. These facts, however, bring us in contact with certain less desirable consequences. Too great a diminution in the protein must bring us to a point where the nitrogen intake may be insufficient for maintenance. Even in the full-grown individual the constant wear and tear of the living tissues leads to a continuous and important loss of nitrogen, and the protein intake must never be reduced below what is necessary to replace this loss. The amount of protein requisite for this purpose is not very large, and as a practical reality it is hard to reduce the protein below this safety-level without making the diet so unpalatable that the patient will reject it. Again, it must be borne in mind that anything like total exclusion of fat from the diet will cause a very great fall in the caloric value; weight for weight, fat gives more than twice the supply of energy that carbohydrate or protein do, and to get a diet which is rich in energy without containing fat means necessarily that such a diet will be very bulky.

An even greater danger attendant upon a diet low in protein and fat lies in the fact that such a diet may prove to contain insufficient vitamins. It is well established that one of the most important of these accessory food substances is most commonly associated with the animal fats; reduction of fat means reduction of the total amount of fat-soluble vitamin. This aspect of our problem is seen to be still more important when it is realised that vitamin deficiency is more marked in the presence of carbohydrate excess than with a generally low diet. On the one hand, we know that absolute starvation rarely leads to signs of deficiency diseases; on the other hand, it has been frequently observed that it is the pigeon which eats large quantities of polished rice which develops avian polyneuritis more rapidly than his more abstemious companions do. Fortunately it is easy to prepare a diet high in carbohydrate and low in protein and fat which yet contains abundant vitamins; the addition of a little marmite and a sufficiency of raw fruit or salad will readily secure this.

One most important effect of such a diet has not yet been mentioned, its action upon the flora of the alimentary canal. The problem of intestinal bacteriology is so immense, its complexity is so prodigious, that few bacteriologists have made any serious attempt to classify the organisms normally found in this site. Certain specific organisms, such as the *Bacillus typhosus* and the dysentery bacilli, have been isolated and closely studied; but common bacteriological technique consists of planting specimens of fæces on media which will kill all but a few of these specific organisms, rather than of making any endeavour to identify all the varieties which may be present. In view of the difficulty of the investigation, it is hardly surprising that our ideas on infection of intestinal origin remain vague.

But it is possible, even without considering the organisms known to cause specific disease, to point to two great groups of organisms normally present whose characters are widely divergent: these are, firstly, the indol-producing group, which live upon the products of protein digestion, and the acidophilous group, which prefer a carbohydrate diet. The first of these groups is thought to play a part, if indeed its members be not the direct cause, in many generalised infections; the organisms are typical putrefactive organisms, and when they are present in abundance, ethereal sulphates and indican are present in the urine. What is more important in connexion with the present lecture is that this group becomes rapidly replaced by the acidophilous group of organisms as soon as the patient is put on a high carbohydrate diet. One caution must be made here; the acidophilous group form gas with many sugars, and this excess of carbon dioxide does in some cases cause a certain amount of intestinal distension. It is not noticeable in the majority of cases, and when it does prove a difficulty it can often be overcome by giving saccharose or certain other sugars instead of glucose.

DISEASES IN WHICH HIGH CARBOHYDRATE DIETS ARE USEFUL.

I hope that from these introductory remarks on the functions of carbohydrate certain practical applications may already be evident. It is high time that we made a practice of choosing diets in accordance with some such principles. At the same time it would be unwise to attempt to make any complete list of diseases in which high carbohydrate is advisable, and the following indications do not pretend to do more than record a few examples where such a diet has proved of advantage.

First, we may consider cases amongst infants. For many years the protein of the diet was considered the all-important feature, but more recently, especially following certain widely-published German books, there has been a tendency to ascribe malnutrition in artificially fed babies more to errors in the amounts of carbohydrate or fat than of protein. Recent work by British, French, and American authorities has somewhat shaken the supposed scientific foundation of the work of Czerny and Finkelstein, but there remains a fairly strong consensus of opinion which favours the addition of carbohydrate to the diet of one group of these wasting infants. This group includes those described by Czerny as having the "exudative diathesis," others disagree with his clinical classification, and in general it may be said that consultation of many authorities tends to lead to increased confusion. This much may be asserted, however, that if a wasting baby has hard constipated motions consisting largely of fat and calcium soaps, great benefit can usually be secured by reducing the fat in the patient's diet, and increasing the carbohydrate, by means of dextrimaltose or some similar preparation. The subject, which is admirably dealt with by Dr. Leonard Parsons in his Goulstonian Lectures,[1] is too vast for further discussion here.

In adults and older children the following classification includes many of the indications for high carbohydrate diets.

1. *Certain Specific Infections.*

(*a*) *Pneumococcal pneumonia* provides an excellent illustration of the utility of such diets in acute diseases. My attention was long since directed to the fact that, if at autopsy you examine the stomach of a man who we have recently obtained an interesting sidelight on the subject in the course of investigating the digestive functions of two of our cases. In each case arrangements had been made for the patient to be examined with the X rays on a certain morning, and she was given her opaque meal, although on waking she had found that a slight attack of migraine was beginning. The X rays revealed a complete absence of peristalsis in the stomach, and at the end of six hours of voluntary starvation none of the opaque meal had passed through the pylorus into the duodenum. It was clear that digestion was in complete abeyance. It is obvious that any drug taken by mouth under such conditions would not reach the small intestine, from which alone it could be absorbed. This explains the futility of giving drugs when an attack has once begun. It explains also why the patient is generally unwilling to take food of any kind until the attack is over, and why, if he has already had a meal, his one desire is to eject it from his stomach as soon as possible. It is less easy to understand why relief should follow vomiting when no food has been eaten during the day, as nothing is brought up but a little mucous fluid, followed, if the vomiting is severe, by the scanty, bile-stained contents of the duodenum. But relief undoubtedly occurs, and in my experience the only means by which an attack can often, though not always, be aborted, is to induce vomiting by swallowing large quantities of warm water containing sodium bicarbonate or, when this fails, by actually washing out the stomach. Perhaps forcing the stomach to contract sends impulses up the vagus, which modify the "storm-centre" in such a way that it ceases to discharge.

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[1] See THE LANCET, April 5th, 19th, and May 10th, 1924.

The wise practitioner and physician learn to draw sound conclusions from their own ophthalmoscopic observations in nervous and other diseases. But the examination of the eyes and their treatment in cases of migraine can only be undertaken by the specialist, and a specialist who is ready to devote much time to the study of the subject. The great advance in our knowledge of disorders of digestion during the last 20 years is largely due to a wise coöperation between the physician and the surgeon, the biochemist and the radiologist. Advance in our knowledge of the pathogenesis and treatment of migraine should come, I feel sure, through a similar close coöperation between the physician, the neurologist, and the ophthalmologist. The friends of the late Dr. Savill founded this lectureship in his memory as part of a scheme to *promote and encourage research and education* in neurology. I fear I have fulfilled my task inadequately, but if what I have said has the effect of stimulating the general practitioner, the physician, and the neurologist on the one hand, and the ophthalmic specialist on the other, and especially those whose experience in the direction I have indicated has not hitherto been encouraging, to investigate the subject without *arrière pensée*, I shall feel satisfied. For in its recurrent crippling influence on the work of men and women of the highest intelligence, during their years of greatest mental activity, migraine stands alone.

An Address

ON THE

THERAPEUTIC USES OF HIGH CARBOHYDRATE DIETS.

Delivered before the Leicester Medical Society

By T. IZOD BENNETT, M.D., M.R.C.P. Lond.,
ASSISTANT PHYSICIAN AND ASSISTANT TO THE PROFESSOR OF PHYSIOLOGY, MIDDLESEX HOSPITAL; PHYSICIAN TO THE ROYAL NATIONAL ORTHOPÆDIC AND ST. SAVIOUR'S HOSPITALS; LATE BEIT MEMORIAL FELLOW FOR MEDICAL RESEARCH.

The subject of high carbohydrate diets is one well worthy of study for several reasons. In the first place, it is probably true to say that all existing treatises on dietetics contain masses of accumulated wisdom which are often devoid of any real scientific explanation. All of us can give examples of diets which are suitable or unsuitable in given conditions, but how seldom are we able to give a clear and logical explanation of such suitability or otherwise. From another point of view I feel this subject to be of interest, for we are becoming more and more aware of the weakness of the orthodox methods at our disposal for combating disease. Advances in our knowledge of pathology and of methods of diagnosis are so rapid that the house surgeon of to-day feels almost out of date when he compares what is taught to the junior clinical clerk with what he himself studied three or four years previously. It cannot be said that there is any similar rapid advance in the realm of therapeutics. If, then, we can envisage some new and broad therapeutic principle, we have made a considerable advance in our practical knowledge. I believe that high carbohydrate diets offer us a possibility in this respect.

PHYSIOLOGICAL SIGNIFICANCE OF CARBOHYDRATES IN DIET.

Let us begin by reviewing very briefly the physiological significance of the carbohydrate portion of our diet. The matter may be summarised in the shortest manner by saying that carbohydrates in the food are all reduced in the intestine to sugar, that they are absorbed in that form and subsequently serve as a source of energy, or, in other words, form the necessary fuel for the tissues.

But certain other considerations must be borne in mind which, if not fundamental, are of great practical importance to the physician.

(*a*) Carbohydrates are usually completely absorbed; even in diseases where diarrhœa is present it is unusual for any carbohydrate to escape complete digestion. And when some slight loss does occur it is rather on account of the cellulose envelope which shuts in the carbohydrate in certain vegetables, than on account of indigestibility of the carbohydrates themselves; when the carbohydrate food has been cooked, this cellulose envelope is almost invariably ruptured and the free starch then undergoes complete digestion. Very different is the state of affairs as regards the fats and the proteins; in diarrhœal diseases, in jaundice, or with faulty pancreatic secretion, the loss of one or both of these constituents may be very considerable.

(*b*) After absorption the carbohydrates require no great work on the part of the tissues in the process of their combustion and the elimination of their end-products. The absorbed sugar passes up the portal vein to the liver and thence to the general circulation, being burnt up according to the activity of the muscles and other tissues, or being stored first as glycogen and then perhaps as fat, if it be in excess of the energy needs of the moment. The end-products of combustion are singularly easy for the body to dispose of. The carbonic acid gas is readily eliminated by the lungs without effort or inconvenience of any kind; water, the only other end-product, is eliminated with equal ease by the kidney, and, be it noted, elimination of water by the skin can be readily performed if the renal function is below par. Proteins, on the other hand, after their absorption as amino-acids, must for the most part be substantially changed by the liver, the denitrification of these bodies calls for an appreciable amount of work by that organ, and the end-products so formed—urea, uric acid, and other nitrogenous substances—charge the blood with, at best, inert products, which require work from the kidneys before they can be eliminated. Nor are the fats less exacting. We know that they are after absorption less readily burnt up than the other foods. An actual provision of oxygen is called for for this purpose, and, when this is deficient, aceto-acetic and hydroxybutyric acids, poisonous substances, may be produced with very definite ill-results.

It might be urged that by increasing the carbohydrate in the food, the digestion of sugar would be so increased as to flood the blood with glucose, producing a hyperglycæmia, as in diabetes, and a consequent glycosuria. In practice this does not occur. To produce such a hyperglycæmia, in any but a diabetic person, it is necessary to secure a very rapid absorption of sugar from the intestine, and actually, unless glucose itself be given by the mouth, it is almost impossible to do this. The digestion of starch is slow enough to secure a steady and prolonged absorption of glucose without great excess at any given moment.

From what has been said above it follows that, if to a normal diet you add further carbohydrate, you will tend to increase the patient's supply of energy, and you will thus tend to fatten him. At the same time, you are providing that form of energy which is most easily accessible, and the one which throws the least additional work on the internal organs of metabolism and excretion.

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An even greater danger attendant upon a diet low in protein and fat lies in the fact that such a diet may prove to contain insufficient vitamins. It is well established that one of the most important of these accessory food substances is most commonly associated with the animal fats; reduction of fat means reduction of the total amount of fat-soluble vitamin. This aspect of our problem is seen to be still more important when it is realised that vitamin deficiency is more marked in the presence of carbohydrate excess than with a generally low diet. On the one hand, we know that absolute starvation rarely leads to signs of deficiency diseases; on the other hand, it has been frequently observed that it is the pigeon which eats large quantities of polished rice which develops avian polyneuritis more rapidly than his more abstemious companions do. Fortunately it is easy to prepare a diet high in carbohydrate and low in protein and fat which yet contains abundant vitamins; the addition of a little marmite and a sufficiency of raw fruit or salad will readily secure this.

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In adults and older children the following classification includes many of the indications for high carbohydrate diets.

1. *Certain Specific Infections.*

(*a*) *Pneumococcal pneumonia* provides an excellent illustration of the utility of such diets in acute diseases. My attention was long since directed to the fact that, if at autopsy you examine the stomach of a man who we have recently obtained an interesting sidelight on the subject in the course of investigating the digestive functions of two of our cases. In each case arrangements had been made for the patient to be examined with the X rays on a certain morning, and she was given her opaque meal, although on waking she had found that a slight attack of migraine was beginning. The X rays revealed a complete absence of peristalsis in the stomach, and at the end of six hours of voluntary starvation none of the opaque meal had passed through the pylorus into the duodenum. It was clear that digestion was in complete abeyance. It is obvious that any drug taken by mouth under such conditions would not reach the small intestine, from which alone it could be absorbed. This explains the futility of giving drugs when an attack has once begun. It explains also why the patient is generally unwilling to take food of any kind until the attack is over, and why, if he has already had a meal, his one desire is to eject it from his stomach as soon as possible. It is less easy to understand why relief should follow vomiting when no food has been eaten during the day, as nothing is brought up but a little mucous fluid, followed, if the vomiting is severe, by the scanty, bile-stained contents of the duodenum. But relief undoubtedly occurs, and in my experience the only means by which an attack can often, though not always, be aborted, is to induce vomiting by swallowing large quantities of warm water containing sodium bicarbonate or, when this fails, by actually washing out the stomach. Perhaps forcing the stomach to contract sends impulses up the vagus, which modify the "storm-centre" in such a way that it ceases to discharge.

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[1] See THE LANCET, April 5th, 19th, and May 10th, 1924.

The wise practitioner and physician learn to draw sound conclusions from their own ophthalmoscopic observations in nervous and other diseases. But the examination of the eyes and their treatment in cases of migraine can only be undertaken by the specialist, and a specialist who is ready to devote much time to the study of the subject. The great advance in our knowledge of disorders of digestion during the last 20 years is largely due to a wise coöperation between the physician and the surgeon, the biochemist and the radiologist. Advance in our knowledge of the pathogenesis and treatment of migraine should come, I feel sure, through a similar close coöperation between the physician, the neurologist, and the ophthalmologist. The friends of the late Dr. Savill founded this lectureship in his memory as part of a scheme to promote and encourage research and education in neurology. I fear I have fulfilled my task inadequately, but if what I have said has the effect of stimulating the general practitioner, the physician, and the neurologist on the one hand, and the ophthalmic specialist on the other, and especially those whose experience in the direction I have indicated has not hitherto been encouraging, to investigate the subject without *arrière pensée*, I shall feel satisfied. For in its recurrent crippling influence on the work of men and women of the highest intelligence, during their years of greatest mental activity, migraine stands alone.

An Address

ON THE

THERAPEUTIC USES OF HIGH CARBOHYDRATE DIETS.

Delivered before the Leicester Medical Society

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THE subject of high carbohydrate diets is one well worthy of study for several reasons. In the first place, it is probably true to say that all existing treatises on dietetics contain masses of accumulated wisdom which are often devoid of any real scientific explanation. All of us can give examples of diets which are suitable or unsuitable in given conditions, but how seldom are we able to give a clear and logical explanation of such suitability or otherwise. From another point of view I feel this subject to be of interest, for we are becoming more and more aware of the weakness of the orthodox methods at our disposal for combating disease. Advances in our knowledge of pathology and of methods of diagnosis are so rapid that the house surgeon of to-day feels almost out of date when he compares what is taught to the junior clinical clerk with what he himself studied three or four years previously. It cannot be said that there is any similar rapid advance in the realm of therapeutics. If, then, we can envisage some new and broad therapeutic principle, we have made a considerable advance in our practical knowledge. I believe that high carbohydrate diets offer us a possibility in this respect.

PHYSIOLOGICAL SIGNIFICANCE OF CARBOHYDRATES IN DIET.

Let us begin by reviewing very briefly the physiological significance of the carbohydrate portion of our diet. The matter may be summarised in the shortest manner by saying that carbohydrates in the food are all reduced in the intestine to sugar, that they are absorbed in that form and subsequently serve as a source of energy, or, in other words, form the necessary fuel for the tissues.

But certain other considerations must be borne in mind which, if not fundamental, are of great practical importance to the physician.

(*a*) Carbohydrates are usually completely absorbed; even in diseases where diarrhœa is present it is unusual for any carbohydrate to escape complete digestion. And when some slight loss does occur it is rather on account of the cellulose envelope which shuts in the carbohydrate in certain vegetables, than on account of indigestibility of the carbohydrates themselves; when the carbohydrate food has been cooked, this cellulose envelope is almost invariably ruptured and the free starch then undergoes complete digestion. Very different is the state of affairs as regards the fats and the protëins; in diarrhœal diseases, in jaundice, or with faulty pancreatic secretion, the loss of one or both of these constituents may be very considerable.

(*b*) After absorption the carbohydrates require no great work on the part of the tissues in the process of their combustion and the elimination of their end-products. The absorbed sugar passes up the portal vein to the liver and thence to the general circulation, being burnt up according to the activity of the muscles and other tissues, or being stored first as glycogen and then perhaps as fat, if it be in excess of the energy needs of the moment. The end-products of combustion are singularly easy for the body to dispose of. The carbonic acid gas is readily eliminated by the lungs without effort or inconvenience of any kind; water, the only other end-product, is eliminated with equal ease by the kidney, and, be it noted, elimination of water by the skin can be readily performed if the renal function is below par. Proteins, on the other hand, after their absorption as amino-acids, must for the most part be substantially changed by the liver, the denitrification of these bodies calls for an appreciable amount of work by that organ, and the end-products so formed—urea, uric acid, and other nitrogenous substances—charge the blood with, at best, inert products, which require work from the kidneys before they can be eliminated. Nor are the fats less exacting. We know that they are after absorption less readily burnt up than the other foods. An actual provision of oxygen is called practice of giving a dessertspoonful in a tumbler of water occasionally is of little use. My practice is to have a strong solution, made by dissolving over half a pound of glucose in a quart of boiling water, in which two lemons are steeped; when cooled this makes a very palatable drink, and I have found it easy to administer sometimes nearly a pound of glucose a day in this manner. The administration must be spaced out as much as possible, or else a good deal of the sugar will escape in the urine, but even here there is no danger unless the patient be a diabetic. In cases of chronic hepatic disease the indication is to give starches with very low protein, as in the diseases discussed in the next paragraph.

6. *The Renal System* supplies further indications for high carbohydrate diets. We are to-day inclining more and more to consider nephritis from the point of view of the biochemist rather than from that of the morbid anatomist. When faced with a case of chronic nephritis we inquire whether this patient is affected more by an inability to excrete salts or by a failure to eliminate the nitrogenous waste-products. The French have long made the useful distinction between the hydropigenous or dropsical patient, and the azotæmic or uræmic one.

Modern biochemical tests, such as the urea-concentration test, or the estimation of urea and non-protein nitrogen on the blood, aim at determining the capacity of the kidney for eliminating the nitrogenous waste products. When such tests inform us that the capacity of the kidney for performing this function is diminished, we are immediately faced with an indication for a diet in which the carbohydrate proportion is increased and the protein reduced. One cannot but be astonished at the frequency with which patients with acute nephritis are encouraged to imbibe large quantities of milk, a diet for which, to say the least of it, there is no scientific indication. I would say that in acute nephritis glucose is again the food for which there is a call, as it is the one which alone yields harmless end-products, and that in chronic cases, where there is diminished nitrogen excretion, starch rather than protein must be chosen.

There are many medical and surgical conditions to which I have made no allusion, but I hope that I have given some indication of the wide and useful field for the application of high carbohydrate diets; it remains to say a few words as to how such a diet may be chosen. I have already mentioned the strong glucose solution which I have found so useful in acute cases; it is also of value in more chronic ones if used sparingly and as an adjuvant to the diet. In these cases it should be given in such doses that the blood is never over-charged with sugar, and hence no glycosuria is produced; this is merely a question of spacing out the feeds properly.

Of foods, the most useful group is that which are known in France as pâtes: macaroni, vermicelli, nouilles, and various substances prepared from flour, arrowroot, sago, and other starchy substances. The list makes one reflect on the sad state into which the art of cooking has fallen in this country. In Italy or in any southern country the preparation of these foods is an everyday matter, yielding delicious results; here it is often impossible to obtain them in palatable form. Many of the starchy vegetables—potatoes, carrots, artichokes, &c.—are most useful, as are also the cereal foods, a great variety of which are now imported from the United States. A good book of diet tables is of much value to the practitioner in devising such a diet.

In chronic cases fresh fruit is often invaluable, not on account of its carbohydrate content, but because it enables us to supply that measure of palatability which is very essential for the well-being of our patients; it has the further advantage of giving sufficient cellulose to maintain the bulk of the fæces and so prevent constipation, and of ensuring a plentiful supply of vitamins.

SPLANCHNIC ANALGESIA.

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OPERATIONS on the upper abdomen are attended with a certain mortality, the causes of which may be numerous, but probably shock and chest complications are the greatest contributors to this mortality. It is obvious, therefore, that if some procedure can be used which will combat these two evils, a great improvement will have been made in abdominal surgery. The chest complications are due to prolonged inhalation anæsthesia, combined with which is the fact that the operative field lies immediately under the diaphragm, the movements of which must of necessity be impeded. The smaller movements of the diaphragm result in stagnation in the bases of the lungs, thus predisposing them to inflammatory complications induced by the irritant vapour. The shock is caused by repeated harmful stimuli passing to the central nervous system via the semilunar ganglia and splanchnic nerves, which supply the visceral peritoneum and intestinal tract.

Is there, then, some means of reducing the amount of anæsthetic administered, and at the same time cutting off the harmful impulses passing up the splanchnic nerves? The answer is found in splanchnic analgesia, with which this article deals.

Technique.

Splanchnic analgesia has been used for some time on the Continent and in America, and it was at Mr. G. Gordon-Taylor's suggestion that I investigated its possibilities, and through his kindness I have been able to use this method on patients from his wards at the Middlesex Hospital. The technique used is not original, but is that described in Gaston Labat's book on Regional Anæsthesia. The principle of splanchnic analgesia is that novocaine is deposited close to the semilunar ganglia and cœliac plexus so as to cut off the impulses passing from these nerves, thus enabling the viscera to be handled without causing pain or shock.

To give a brief description of the anatomy of the parts involved, the cœliac plexus consists of the cœliac or semilunar ganglia which lie on either side of the commencement of the abdominal aorta at the origin of the cœliac axis artery. The two ganglia lie on the crura of the diaphragm, that on the right lying behind the inferior vena cava. They lie internal to the suprarenal glands, and are at the level of the first lumbar vertebra. The two ganglia are connected together, in front of the aorta and around the origin of the cœliac axis artery, by a plexus of nerves which, with the ganglia, constitute the cœliac or solar plexus. Entering the upper part of the plexus are the great splanchnic nerves, which are derived from the thoracic sympathetic chain and primarily from the fifth to the ninth or tenth dorsal nerves, the nerves piercing the crura of the diaphragm to reach the plexus. From the plexus secondary plexuses pass to the abdominal viscera and visceral peritoneum.

It will be seen that the neighbourhood of the plexus to be injected is one which is not to be approached except with great care and delicacy, because of the proximity of the large vessels; therefore it is necessary for anyone taking up this procedure to familiarise himself with the anatomy of this region, and by repeated practice on the cadaver to make sure of the method and technique. The route adopted has been the posterior one, using a fine needle 12 cm. long. In those cases in which the operation is carried as far as possible without any general anæsthetic, preliminary injections of morphine and scopolamine are given, but if a light general anæsthetic is administered from the commencement then the usual injection of morphine and atropine is used instead.

The method of procedure is as follows: The patient is placed on the side opposite that to be injected, with a small pillow placed under the loin to prevent has died of pneumonia, you will usually find, stagnating within it, all the food given him for several days prior to his death. The disease is too violent in its onslaught for normal digestion to be possible, and, if we remember that the period before the crisis rarely lasts ten days, it becomes clear that a highly digestible dietary, containing readily assimilable energy, is all that can be needed during this time. Glucose is the ideal substance for such a purpose, and I have found that repeated feeds of the strong glucose solution, which I shall describe later, is of great service in these cases. Beyond this all food given before the crisis need be no more than a placebo, and it is indeed of benefit to keep its amount very small.

(*b*) *In typhoid and paratyphoid infections* the utility of carbohydrates has long been recognised. Whether the administration of these with very limited protein has an actual effect in reducing the infecting organisms in the intestine is, to my mind, doubtful; the beneficial effects of starches and sugars are probably more due to their ready assimilability and the plentiful energy which they supply. In this group of diseases gas formation to which I have alluded must be watched for, as it may sometimes prove very uncomfortable.

(*c*) *In Bacillus coli communis infections* a high carbohydrate diet, with very reduced protein, often appears to be of the utmost service in checking an attack and preventing relapses. Sir Thomas Horder has laid emphasis on this line of treatment, and my own experience is in close agreement with his. These cases, especially those in which the urinary tract is involved, are frequently so resistant to treatment that any possible therapeutic aid is of value; my personal belief is that, if proper attention be given to the diet, in addition to the more usual therapeutic procedures, the course of these troublesome cases is materially shortened. Needless to say, in view of their chronic nature, the diet must be amply sufficient; starches rather than sugars should be chosen, and the protein reduction rigidly enforced, not only by excluding meat, but also by reducing articles such as milk and bread, which contain very appreciable quantities of protein, and by substituting more purely carbohydrate foods.

2. *In Certain Infections of Unknown Origin*, especially some cases of rheumatoid arthritis, great help is afforded by these methods of dieting. About 18 months ago we had the pleasure of welcoming to London Dr. Guelpa, of Paris, who introduced, many years since, a method of treating diabetes, somewhat akin to the modern fasting treatments. Guelpa's treatment consists of fasting and purgation, and, apart from cases of diabetes, I have sometimes seen this treatment produce the most happy results in cases of rheumatoid arthritis which had resisted all other forms of treatment. It is, I believe, worth treating such cases, where the origin of the infection is obscure, and other treatment has failed, by starvation and brisk purgation for several days, followed by a diet consisting chiefly of carbohydrate on the lines I have already indicated.

3. *Diseases of the Heart and Blood-vessels* provide fairly frequent examples of cases in whom this treatment is of use. In cardiac failure we have to avoid throwing extra work on the alimentary canal and the liver; moreover, a plentiful supply of sugar to the blood is often a potent factor in aiding the damaged cardiac muscle. Again, in arterio-sclerotic individuals it is a manifest advantage to supply them with the food that yields sugar, rather than the proteins which call for more metabolic work and a tedious excretion of nitrogenous substances.

4. *Respiratory Diseases* are seldom indications for this diet. Pneumonia has been mentioned. A few obscure cases of asthma have been traced to ingested proteins to which the subject is sensitive, and here carbohydrate replacement may be of use.

5. *The Alimentary System* gives us so many examples that a few only can be quoted. In cases of peptic ulcer, fluid and semi-fluid carbohydrate diets are now used extensively. I think the scientific basis is sound, and I am convinced that the practical utility is great. The main principle, as employed in the Sippy treatment, is to give small frequent feeds the carbohydrate nature of which is least likely to excite gastric secretion and which will never be long delayed in the stomach.

A still more numerous group of diseases of the alimentary tract is that in which undernutrition is the most outstanding feature. It would be out of place to describe these here in detail; I would but say that I refer to that class of patient whom one encounters so frequently, in whom, whether there be an organic lesion present or not, abdominal pain and discomfort have led to curtailment of the diet, loss of weight has aggravated the symptoms, and starvation and undernutrition have become the most prominent physical features. In such patients it is often essential to secure a diet which will not only sustain life, but will also help them to restore their lost subcutaneous and intra-abdominal fat, and usually a high carbohydrate diet is the method of choice for securing this. Such patients are often peculiarly intolerant to fat, and I feel this question is one which will repay much closer study in the future; for the moment I would impress upon you that, when fat cannot be tolerated, a high carbohydrate diet becomes essential if loss of weight is to be prevented.

A further group which must be considered with alimentary diseases is that embracing disorders of the liver. Fat digestion is here frequently imperfect; it is a matter of common knowledge that in practically all jaundiced states the paucity of bile-salts in the alimentary canal leads to a failure of absorption of fat. But note, in addition, that protein metabolism is also seriously affected, for the amino-acids, when absorbed, must in large measure be denitrified by the liver, and, therefore, a high protein diet is one calling for considerable hepatic activity. We must therefore conclude that neither fat nor protein can usefully be administered in any large quantity in such diseases.

But it may be urged that the glycogenetic function of the liver will also be impaired, and that therefore a high carbohydrate diet is equally inapplicable. I do not think this reasoning is correct; the storage of glycogen is but a temporary expedient, useful for securing a steady regulation of the blood-sugar, but not a cardinal necessity, and it is highly probable that if its capacity for storing glycogen is impaired the liver will merely allow the glucose which reaches it by the portal vein to transude into the systemic blood, thus giving a plentiful but somewhat irregular supply of sugar to the tissues.

I can say with emphasis that in acute cases of hepatic disease high carbohydrate, especially when given in the form of glucose, is often of remarkable value. A recent case of this type which I saw was one of delayed chloroform poisoning following prolonged anæsthesia; the administration of large quantities of glucose in solution by mouth produced a most dramatic recovery.

Much interesting experimental work dealing with the total extirpation of the liver in dogs has recently been performed by Mann in the United States; he found that, after recovery from the operation, the animals passed suddenly, after some hours of good health, into a condition of coma with muscular twitchings clinically comparable to the hypoglycæmic convulsions produced by an overdose of insulin; from this condition they were rapidly, though temporarily, restored by the intravenous injection of glucose.

I am convinced that this gives us the clue to the right line of treatment for cases of acute hepatic disease such as eclampsia, acute yellow atrophy, poisoning by chloroform, salvarsan, phosphorus, or other drugs. In these cases a plentiful supply of glucose must be attained, and this is usually easy if we give a strong solution by mouth. The current was induced in the usual way, but instead of performing an abdominal field block a paravertebral dorsal block was performed, blocking the ninth to twelfth dorsal nerves on both sides. Without any general anæsthesia the abdomen was opened from just above the umbilicus to the pubis, and a large malignant ovarian cyst removed, without the patient showing signs of feeling pain, except when the pelvis was swabbed out, which was to be expected. The swabbing of the pelvis having aroused the patient, she was given some ether, which amounted to ʒ iii. only, and the abdomen closed. The patient subsequently said that she had not felt any part of the operation except the preliminary injections.

Another case of gastrectomy being performed on a patient who had already a gastro-enterostomy is the following:—

A woman, aged 46 years, had had a gastro-jejunostomy performed five years previously, and for the last two years had had repeated attacks of pain and vomiting; she was very weak and a poor subject in every way. The usual routine was followed, ether being given throughout the operation. As usual with this type of case the operation was extremely difficult, and the adhesions around the gastro-jejunal ulcer which were present increased the difficulties. The operation lasted two hours; the patient's pulse-rate was 100 at the commencement, but it fell to 82 during the operation, and at the end it was 88. During convalescence the patient was so well that she might have had only a very minor operation; her pulse-rate never rose above 88 and fell to 72 on the third day.

Before concluding, I would like to quote one other case of interest as being one in whom I failed to be able to reach the front of the body of the first lumbar vertebra and yet managed to block the splanchnic nerves by blocking the dorsal nerves a short distance from their exit from the spine by a paravertebral dorsal block.

This patient was a young man, aged 32 years, who gave a very definite history of a chronic gastric ulcer. He was very ill, wasted, and anæmic, and subject to attacks of agonising pain in the back, due to involvement of the pancreas in the ulcer, with the result that he had had little sleep for weeks, and was both a physical and mental wreck. It was decided to operate on him with splanchnic analgesia, but owing to his very nervous condition it was decided to give him some ether from the commencement.

An attempt was made to block the cœliac ganglion in the usual way, but owing to a very narrow angle between the last rib and the spine, or to a long transverse process to the first lumbar vertebra it was impossible, after once striking the body of the vertebra, to alter the angle of the needle without striking either the last rib or the first lumbar transverse process. After repeated trials on both sides I decided to give it up and block the seventh to eleventh dorsal nerves close to their exit from the foramina, with the hope that the novocaine would diffuse forwards, and also block the splanchnic nerves and grey rami communicantes. That this occurred there is no doubt.

Mr. Gordon-Taylor performed a total gastrectomy on this patient, as the ulcer was so large that it extended very close to the cardiac orifice of the stomach, its floor being formed by the pancreas. The operation lasted two hours, and although the manipulations were carried right up to the œsophageal orifice of the diaphragm and most dense adhesions dealt with, the respirations of the patient did not alter, and very little ether was administered to him. His pulse-rate was 100 at the commencement and 132 at the end of the operation, and subsequently he made a good recovery, though the day following the operation he was in a very weak state. Both Mr. Gordon-Taylor and Mr. H. P. Crampton, who anæsthetised the patient, are quite certain that the patient could not possibly have undergone what he did unless the shock had been reduced so strikingly by blocking the splanchnic nerves.

The last case I will quote is that of a man, aged 35 years, with seven years' history of chronic gastric ulcer, and also a history of a healed pulmonary tuberculous lesion. It was considered advisable to avoid a general anæsthetic in this man's case, hence the preliminary injections of morphine and scopolamine were given, and splanchnic analgesia induced without a general anæsthesia. Instead of doing the usual field block on this case, I did a paravertebral dorsal block from D6–D10 on both sides.

The abdomen was opened painlessly, and an ulcer causing stenosis of the pylorus was found; a partial gastrectomy was decided upon. The operation was continued for 1 hour 30 minutes without any anæsthetic, and during this time the duodenum had been divided, after great difficulty in separating it from the pancreas. The distal end of the duodenum was closed and the stomach turned over to the left with further division of the lesser omentum. When an attempt was made to bring up a loop of jejunum the patient felt pain when the lower end of the abdominal incision was handled, due, no doubt, to the fact that only the tenth nerve had been blocked, whereas it would have been wiser to have included the eleventh as well. Ether was therefore given till the end of the operation, which lasted 20 minutes longer. At the commencement the pulse-rate was 80, which rate was maintained throughout until the end when it was as low as 60, which it was when the patient left the table. He made a good recovery.

I think that these cases quoted show conclusively the undoubted advantages of this method of reducing shock and the amount of anæsthetic administered.

Advantages and Disadvantages of the Method.

I now propose to review the advantages claimed for this method, which has definitely improved the outlook for patients who have to undergo operations of a large magnitude on the upper abdomen.

1. *The Shock* in all cases has been conspicuous by its absence, as shown by the general appearance of the patients and by the pulse-rates. The general condition of the patients has been extraordinary, for instead of being patients who seem to have lost interest in themselves and their surroundings, they are so well that they rather resent the administration of rectal salines and such nursing as they must have. This is the only drawback to the method according to the sister in charge of these cases. A point in support of the absence of shock is the fact that no blood transfusion has been necessary since this new method has been used, whereas previously it was quite a common occurrence with difficult cases.

2. *Chest Complications.*—In this series of cases not one patient has developed any chest complications, and this includes one patient with a very definite chronic bronchitis, and one with healed tubercle. There is no doubt that prolonged inhalation anæsthesia is responsible for many fatal chest complications in abdominal operations, and this method affords an excellent way of reducing the amount of drug inhaled. In connexion with the respiratory system, it is worthy of note that by means of this technique the exaggerated respiratory movements seen with deep surgical inhalation anæsthesia are entirely done away with. These movements must of themselves be very fatiguing to the patients, as anyone can prove by performing as deep and rapid respiratory movements oneself. It is impossible to continue for more than a few moments, and yet patients may keep this up for one and a half to two hours.

3. *Post-operative Vomiting.*—This rarely occurs, or is so reduced that it scarcely distresses the patient. This has a great advantage, apart from the patient's comfort, in that suture lines both within the abdomen and in the abdominal wall are not strained.

4. *Cases Not Admitting of General Anæsthesia.*—Patients with weak hearts or diseased lungs or any other condition contra-indicating a general anæsthetic can be operated on with very reduced risks, and, in fact, a patient otherwise considered inoperable might well be saved by the use of this new method. It is early yet to discuss fully the advantages and disadvantages of splanchnic analgesia; the advantages I have set out, the disadvantages appear to me to be few: the careful practice and knowledge of anatomy required can scarcely be called a disadvantage. The fact that it is not always possible to be certain of a complete anæsthesia demands the presence of an anæsthetist apart from the surgeon, unless this technique be practised by one who is an anæsthetist. The time taken to perform the injections varies, of course, with the skill and experience of the person performing them, but they take 20 minutes to half an hour in a difficult case. These two points seem to me to be the only disadvantages of the

sagging of the spine. The first lumbar spine is identified, and at a point opposite this and 7 cm. external to it a cuticular wheal is raised with a fine needle, using 1 per cent. novocaine—this point is usually found to be on the lower border of the last rib. Through this cuticular wheal the 12 cm. needle is now introduced and pushed on a little upwards, and at an angle of about 45° to the median plane, until its point is felt to come into contact with the side of the body of the first lumbar vertebra. When this bony contact has been made, the needle is withdrawn to the subcutaneous tissues and the angle altered so that the needle now advances more to the front of the vertebra and the bony contact again made. This procedure is repeated until the needle is felt to slide by the edge of the body of the vertebra, when it is pushed 1 cm. further, and, after aspiration to see that the needle is not in the lumen of the vessel, 30 c.cm. of 1 per cent. novocaine are slowly injected.

The needle is again withdrawn to the subcutaneous tissues and its direction changed downwards towards the second lumbar vertebra, and the process repeated until 15 c.cm. of 1 per cent. solution can be deposited in the corresponding position to that vertebra. The result is that 45 c.cm., of 1 per cent. novocaine are left diffusing amongst the loose areolar tissue on the antero-lateral aspects of the *first* and *second* lumbar vertebræ, and therefore bathing the splanchnic nerves and cœliac plexus. It was from trial that it was found that by directing the needle upwards as well as forwards and inwards, which is a slight modification of Labat's technique, the needle in most cases comes into very close contact with the great splanchnic nerve itself. The patient is now turned on to the side just injected and the same procedure repeated on the other side, so that altogether 90 c.cm. of 1 per cent. novocaine are used for blocking the cœliac plexus.

The patients do not seem to feel much pain on the introduction of the needle, provided it is done gently, but it is always possible to infiltrate the track of the needle with some novocaine if it is thought desirable. In those cases in which a light ether narcosis is maintained from the commencement there is no question of difficulty in introducing the needles. The blocking of the cœliac plexus does not, of course, affect the sensibility of the abdominal wall, and therefore it is necessary to perform an abdominal field block as well before the abdomen can be opened, or as an alternative, a paravertebral dorsal block can be done. The patient, after the completion of the splanchnic injection, is now turned on to the back and the abdomen uncovered.

If the patient is conscious, cuticular wheals are raised at the point of the xiphisternum, at the outer border of the rectus where it crosses the costal margin, and at points along the linea semilunaris to just below the umbilicus on both sides. Through each of these wheals a needle 5 cm. long is introduced in turn and pushed into the rectus sheath, where about 2 c.cm. of the 1 per cent. solution is deposited at each point where the sheath is entered. The exact method is that the needle is first entered at right angles to the skin into the rectus sheath, and then more obliquely upwards and downwards, so that one point of skin entry is used for several points of entry into the rectus sheath. By the time that the last injections have been made the recti will be found to be perfectly relaxed, and when that is so the operation can be commenced.

Record of Cases.

I have carried out this procedure in 18 cases, and in every case there has been ample proof that the cœliac plexus has been blocked. In five of the cases the operations have been commenced and continued for some time without any general anæsthetic, and in two of the cases the operations have been completed without giving any general anæsthetic at all. By the time that the first three cases had been operated upon without general anæsthetic, it had been decided that the amount of ether required to keep the patients just unconscious from the beginning could not be very harmful, whereas it relieved the surgeon of the anxiety inseparable from performing a major operation on a conscious patient. For this reason all the subsequent cases have been done under a first-stage ether narcosis from the commencement, unless there has been some definite contra-indication to a general anæsthetic.

The first case on whom this new method was used was a man, aged 43 years, suffering with a chronic gastric ulcer and under Mr. Gordon-Taylor's care, as were all the patients described in this article. This patient was rather a nervous man, but the injections were carried out without causing him any undue discomfort. Without general anæsthesia the abdomen was opened, and the operation of partial gastrectomy proceeded with as far as division of both omenta and freeing the duodenum from the pancreas. When the clamp was passed under the duodenum and tightened, the patient became restless and ether was then given in just sufficient quantity to keep him asleep, and in this way the operation was completed. The man's pulse was 112 when he left the table, and at no time had his respirations been accelerated, which is invariably the case when traction is made on the viscera of the upper abdomen, which was convincing proof that the splanchnic nerves had been blocked. One advantage that this first case showed was the quietness of the respiratory movements; they were so small as to cause not the slightest inconvenience to the operator, a great contrast to the exaggerated respirations of an ether anæsthesia, and this point has been noticed in all subsequent cases. This patient had a most strikingly easy convalescence despite the fact that he was distinctly debilitated by his disease; he showed no evidence of shock or post-operative pain. A point worthy of note is that this patient is the first gastrectomy case of Mr. Gordon-Taylor's who has not had morphine on the night of the operation. The next morning he was sitting up in bed very well indeed, and the remainder of his convalescence was uneventful.

The second case was a man, aged 48 years, who, when the abdomen was opened, was found to have an inoperable carcinoma of the duodenum, for which a posterior gastro-jejunostomy was performed. The operation was completed without any general anæsthetic, and the patient subsequently said that he knew that something was being done, but there was "total absence of pain." The patient's pulse normally varied between 84 and 100, and at the end of the operation was 96. He had an uneventful convalescence. One hour after his return to bed he was talking as though he had not undergone any operation.

Another case was a private patient of Mr. Gordon-Taylor, who was given light ether anæsthesia throughout, and on whom a partial gastrectomy was performed. This was a very difficult case, the patient having had a posterior gastro-enterostomy performed one year previously by another surgeon, and a great number of adhesions had to be dealt with, which prolonged the operation. The operation lasted 2 hours and 20 minutes, but at the end of the time the patient's pulse was only 84, and subsequently it was never more than 82 during a rapid and easy convalescence. The patient volunteered that he felt better after this operation than he did after his first one.

The next case was a hospital patient, a man, aged 48 years, with a carcinoma of the stomach for which a partial gastrectomy was performed. The operation was continued as far as division of both omenta and the duodenum, but when the junction was commenced between the stomach and jejunum the patient appeared to feel pain, and therefore a mixture of ether and chloroform was given to finish the operation, the amount used being only 3 drachms. It is worthy of note that this patient had a chronic bronchitis, but he had no trouble from this during his convalescence, which he undoubtedly must have had had the operation been performed wholly under an inhalation anæsthesia. The pulse-rate after operation was 72; the operation lasted one hour. Three hours after the operation this man was asking if he might smoke, and on the following morning said he felt quite well enough to leave the hospital.

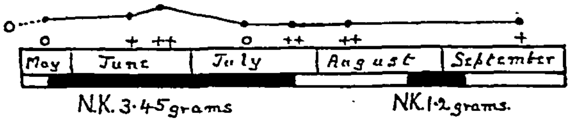
Two cases have been done that were not gastric cases, one a splenectomy and the other an ovariotomy.

The splenectomy was performed on a man, aged 26 years, suffering with splenic anæmia, light ether anæsthesia being given throughout. The patient's pulse-rate was 80 at the commencement of the operation, and remained at this rate throughout the first 20 minutes of the operation; nor did his respiratory-rate vary, even when the spleen, which was very large, was drawn out of the abdomen. When the splenic pedicle was clamped the pulse-rate rose to 92, but respirations did not alter, and at the end of the operation the pulse returned to 80. The patient made an uneventful recovery.

The ovariotomy was performed for a malignant ovarian cyst, which extended above the umbilicus and was associated with ascites. The patient was very ill, having just recovered from broncho-pneumonia, and a general anæsthetic was contra-indicated. In this case the splanchnic analgesia serological reactions. The serum from three patients was found to give a positive W.R. and a negative S.R. Several specimens were obtained from each of these patients, and while the S.R. was consistently negative the W.R. varied from positive to very weak positive, and in each case a negative W.R. was obtained once. The clinical diagnoses in these three cases were respectively chronic laryngitis, congenital deformity of nose, and persistent headaches.

The remaining 19 cases in this group are tabulated below with their diagnoses.

CHART 1.



Early primary case. Uninterrupted treatment.

3. *Cases in which No Records were Obtainable.*—This group contains 16 sera, two of which were positive to the W.R. and negative to the S.R., and 14 were negative to the W.R. and positive to the S.R.

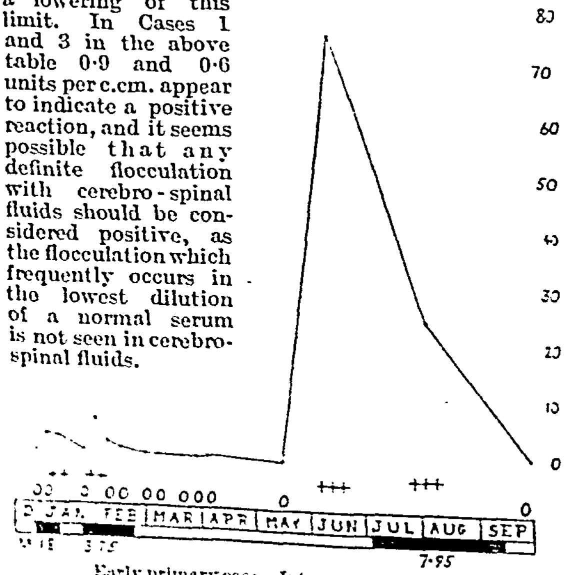
Cerebro-spinal Fluid.

The number of specimens of cerebro-spinal fluid examined was 81. In 77 instances the reactions were in agreement, 63 specimens being negative and 14 specimens positive. The remaining 4 specimens gave different results by the two methods.

Case.	Cerebro-spinal fluid.		Serum.		Diagnosis.
	W.R.	S.R.	W.R.	S.R.	
1	+ + +	0·9	0	0·0	Cerebro-spinal syphilis.
2	+ + +	0·0	+ + +	0·0	Retro-bulbar neuritis.
3	+	0·6	+ + +	33·6	Gummatous meningitis.
4	0	1·7	+ + +	65·6	Tabes dorsalis.

Dreyer and Ward[2] state that cerebro-spinal fluids which contain less than one Sigma unit per c.cm. are to be considered negative, but they consider that further experience may lead to a lowering of this limit. In Cases 1 and 3 in the above table 0·9 and 0·6 units per c.cm. appear to indicate a positive reaction, and it seems possible that any definite flocculation with cerebro-spinal fluids should be considered positive, as the flocculation which frequently occurs in the lowest dilution of a normal serum is not seen in cerebro-spinal fluids.

CHART 1A.



Early primary case. Interrupted treatment.

Flocculation and Complement Fixation in Early Primary Syphilis.

An attempt has been made to follow weekly the course of early primary cases which came under treatment before the serum reactions had become positive. The Sigma readings have been recorded in the form of curves and the W.R. results inserted at the bottom of the charts. Four curves have been selected which emphasise the well-known importance of adequate uninterrupted treatment with arsenobenzol preparations in the early stages of the disease.

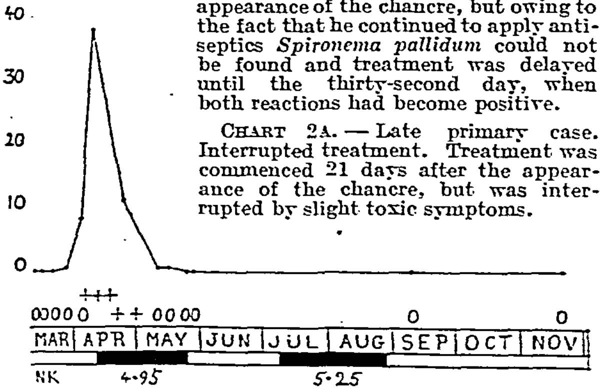
CHART 1.—Early primary case. Uninterrupted treatment. Treatment was commenced seven days after the appearance of the chancre. Small doses of neokharsivan were given without serious interruption for a relatively long period. The Sigma readings never rose to 1·5 units per c.cm. of serum, but there was frequent partial fixation of complement.

CHART 1A.—Early primary case. Interrupted treatment. Treatment was commenced 12 days after the appearance of the chancre. The patient did not attend for a fortnight during the first course of neokharsivan, and this interruption was followed by a rise in the Sigma curve which gradually came down when treatment was resumed. Owing to the appearance of toxic symptoms an unusually long interval elapsed before the commencement of the second course. During this period regular injections of mercury failed to prevent a sharp rise in the Sigma curve.

CHART 2.—Late primary case. Uninterrupted treatment. The patient came for treatment three days after the appearance of the chancre, but owing to the fact that he continued to apply antiseptics *Spironema pallidum* could not be found and treatment was delayed until the thirty-second day, when both reactions had become positive.

CHART 2A.—Late primary case. Interrupted treatment. Treatment was commenced 21 days after the appearance of the chancre, but was interrupted by slight toxic symptoms.

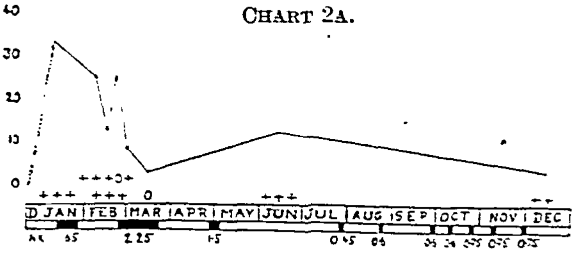
CHART 2.



Late primary case. Uninterrupted treatment.

The four cases had similar mercurial treatment and the only known factor which could contribute to the bad results in 1A and 2A was the interruption of arsenobenzol treatment.

CHART 2A.



Late primary case. Interrupted treatment.

Conclusions.

There is evidence that the S.R. is more delicate than the W.R. in well-treated cases of syphilis and in imperfectly treated cases of long standing, but it appears that reliance solely on either method may lead to a very small proportion of positive sera being missed. In the case of cerebro-spinal fluids the S.R. appears to have little advantage over the W.R. owing to the fact that in the latter reaction a much larger quantity of cerebro-spinal fluid than of serum can be used, whereas in the S.R. the quantities are the same.

From the limited number of primary cases examined it appears that the S.R. usually becomes positive before the W.R., but occasionally a positive W.R. is obtained first.

method, but they are so small that I think they are quite outweighed by the distinct benefit the patients undoubtedly derive from this method of nerve blocking.

I have had a special syringe for regional anæsthesia made for me by Messrs. Arnold and Sons.

In conclusion, I wish to express my thanks to Mr. Gordon-Taylor for suggesting this investigation to me, and for allowing me to use this method on his patients, and also for his permission to publish the cases concerned. I have also to thank the hon. anæsthetists of the Middlesex Hospital for their keenness in coöperating with me in the use of a new method.

FLOCCULATION AND COMPLEMENT FIXATION IN SYPHILIS.

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IN order to test the relative merits of flocculation and complement fixation for the sero-diagnosis of syphilis every suitable specimen of serum or cerebro-spinal fluid sent to the pathological department of St. Bartholomew's Hospital for the Wassermann reaction (W.R.) during the past year has been examined by both methods. The sera included those obtained from the venereal department as well as those from the wards and out-patient department of the hospital. In carrying out the W.R. the technique described by Fildes[1] was followed. The results were recorded as (1) positive +++, complete inhibition of hæmolysis; (2) weak positive ++, slight hæmolysis; (3) very weak positive +, slight inhibition of hæmolysis. The flocculation test employed was the Sigma reaction (S.R.) detailed by Dreyer and Ward.[2] The heart extracts used in the S.R. were kindly supplied from Oxford with suspension factors determined. The number of specimens examined by both methods was 2092, comprising 2011 sera and 81 cerebro-spinal fluids.

Sera: Cases in which the Reactions Agreed.

The results obtained by the two methods were the same in 1755 specimens (87·3 per cent. coincidence)—namely, 1175 negative reactions and 580 positive reactions. The number of positive reactions includes partially positive W.R. results and S.R. readings which indicated 1·5 units per c.cm. of serum.

Sera: Cases in which the Reactions did Not Agree.

In 250 instances the reactions were not in agreement and reference to the clinical records of these cases led to their classification in three groups.

1. *Cases with Definite Evidence of Syphilis.*—Under this heading are grouped all cases which at an earlier date gave a positive reaction by both methods, cases which had definite clinical syphilis, including primary lesions in which *Spironema pallidum* was found, and cases of tabes dorsalis and G.P.I. A less definite class has also been included—namely, those patients who stated that they had been infected with syphilis many years ago. The majority of cases in this group had received some form of anti-syphilitic treatment. The results of the two reactions were as follows:—

W.R. positive and S.R. negative in	31	cases.
W.R. negative and S.R. positive in	176	,,
	207	

A considerable modification of these figures is brought about if the number of persons whose blood was examined is substituted for the actual number of specimens, as in some cases serum from the same patient was examined several times at intervals, varying from a few days to a year. The following figures refer to patients and not to the number of specimens examined.

It will be seen that the results of the S.R. were in agreement with the clinical data in 86 per cent. of this group of cases.

One exam. of serum	73	W.R. pos. and S.R. neg.	15
More than one exam. of serum	52	W.R. neg. and S.R. pos.	108
		Results variable	2
	125		125

With two exceptions, the discrepancies between the two reactions were found each time a specimen of the patient's serum was examined. Seven cases gave a positive or partially positive W.R. and a negative S.R., but none of them consistently gave a fully positive W.R. In those cases which were examined on one occasion there was one in which the W.R. was fully positive and the S.R. negative. Forty-three cases on re-examination were consistently positive to the S.R. and negative to the W.R. The two exceptions were both well-treated cases and the results obtained were as follows:—

		Units per c.cm.
	Case 1.	
First exam. ..	W.R. negative ..	S.R. 1·7
Second ,, ..	,, very weak pos. + ..	,, 1·3
	Case 2.	
First ,, ..	W.R. negative ..	,, 1·5
Second ,, ..	,, weak pos. ++ ..	,, 1·3
Third ,, ..	,, negative ..	,, 1·5

In both cases the reactions were becoming negative after treatment, and the results are, therefore, in practical agreement as a border-line reaction is indicated by both methods.

2. *Cases where Evidence of Syphilitic Infection was Doubtful.*—Thirty-three specimens of serum derived from 24 patients are included in this group. The discrepancy between the W.R. and S.R. in one case was presumably due to an error in technique, as on re-examination the reactions were in agreement. Another case in which a quantitative W.R. was strongly positive was remarkable in the serum exhibiting an unusually high inhibition zone which, at first, caused the S.R. to be considered negative when it was really strongly positive. A specimen of this serum was sent to Dr. H. K. Ward, who reported as follows:—

"The following were the readings after 22 hours' incubation:—

Dilution of Serum.

$\frac{1}{1\cdot25}$	$\frac{1}{2\cdot5}$	$\frac{1}{5\cdot2}$	$\frac{1}{13\cdot1}$	$\frac{1}{26\cdot4}$	$\frac{1}{53}$	$\frac{1}{106}$	$\frac{1}{265}$	$\frac{1}{530}$	$\frac{1}{1060}$	$\frac{1}{2120}$	$\frac{1}{5300}$	$\frac{1}{10600}$
Reading.												
S+	tr+	tr	tr?	0	tr?	tr?	tr	tr+	T	T−	tr?	0

The flocculation in the fore zone was not typical in that there was no clearing commensurate with the degree of flocculation."

The number of Sigma units per c.cm. of this serum was 2865. The patient was suffering from nephritis and there was no evidence of syphilis other than the

(A) *Cases with Positive W.R. and Negative S.R.*

W.R.	S.R.	Diagnosis.	No. of specimens examined.
+++	0	Bilateral nerve-deafness.	3
+++	0	Glossitis.	1
+++	0	Retro-bulbar neuritis.	1
++	0	Diabetes.	2
++	0	Miscarriages.	3
++	0	Meningitis.	1
++	0	Arthritis.	1
+	0	Meningitis	1
+	0	Rheumatic fever.	2
+	0	Bazin's disease.	2

(B) *Cases with Negative W.R. and Positive S.R.*

0	9·0	Septicæmia.	3
0	1·9	Arthritis.	1
0	5·3	Defective vision.	1
0	1·5	Cerebral hæmorrhage.	2
0	2·6	Chronic dyspepsia.	1
0	1·5	Aortic regurgitation.	1
0	3·7	Meningitis.	2
0	1·9	Strabismus.	1
0	1·5	Diabetes.	1

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[1] Fildes, P.: Medical Research Council, Special Report Series No. 78, p. 86.

[2] Dreyer, G., and Ward, H. K.: THE LANCET, 1921, i., 956; and Medical Research Council, Special Report Series No. 78, p. 72.

Prescription of Diets.

This is still the great stumbling-block to many practitioners. They recognise that in no two instances will the course of dieting, if correctly applied, be the same; the amounts of carbohydrate, protein, and fat in the diet will vary according to the several defects of metabolism present. Furthermore, if insulin be given, the distribution of the carbohydrate, protein, and fat over the 24 hours must be correlated with the time or times of its administration and the dosage. The patient's likes and dislikes in the matter of food also demand attention. It is clearly impossible to solve the problem by constructing 24-hour diet-charts to meet every contingency. On the other hand, one may daily, or from time to time, prescribe the meals in detail, so as to conform to the changes in metabolism and the needs of the patient; this would be ideal for

TABLE II.—*A (Specimen) System of Diets.*

B_1: Tea or coffee ad lib. (without milk or sugar).	B_2: Tea or coffee + 1 teasp. thin cream. 1 oz. veg., Group I. ½ hard-boiled egg. 1–2 bran biscuits.	B_3: Tea + 1 teasp. thin cream. 2 oz. veg., Group I. 2 oz. fish. 1–2 bran biscuits with a trace of butter (=1 g. F.).	B_4: Tea + 1 tablesp. milk. 4 oz. fish. 2 oz. salad, Group I. 2 "Akolls."	B_5: Tea + 2 tablesp. milk. 3 oz. fish. 1 egg and ½ oz. bread. 2 "Akolls" + a trace of butter.
0 0 0 =0	1 3·3 3·5 =48·7	2 10·6 1·5 =63·9	2·9 25·1 2·5 =134·5	8·2 27·2 10 =231·6
L_1: Beef-tea, bovril, or clear soup. (Black coffee or unsweetened lemonade.)	L_2: Clear soup or beef-tea. 1½ oz. white fish. 2 oz. boiled veg., Group I. 2 bran biscuits.	L_3: Clear soup or beef-tea. 3 oz. fish. 4 oz. boiled veg., Group I. 2 bran biscuits with a trace of butter.	L_4: Clear soup. 5 oz. fish. 4 oz. boiled veg., Group I. 3 "Akolls" + a trace of butter.	L_5: Soup or bovril. 5 oz., Group X. 5 oz. veg., Group I. 1 oz. potato. 3 "Akolls."
0 1 0 =4	2 9·1 0 =44·4	4 17·2 1 =93·8	4·3 33·2 4 =186	9·7 39·3 18 =358
T_1: Tea or coffee (without milk or sugar).	T_2: Tea + 1 teasp. thin cream. 1 oz. veg., Group I. ½ hard-boiled egg. 1 bran biscuit.	T_3: Tea + 1 teasp. thin cream. 2 oz. salad, Group I. 2 "Akoll" biscuits.	T_4: Tea + 1 tablesp. milk. 2 oz. salad, Group I. 1 oz. chicken or Group X. 2 "Akolls" + trace of butter.	T_5: Tea + 1 tablesp. milk. 3 oz. fish. 3 oz. salad, Group I. 2 "Akolls" + trace of butter.
0 0 0 =0	1 3·3 3·5 =48·7	2·2 4·6 2·5 =49·7	2·9 11·1 6·5 =114·5	3·9 20·4 8·5 =128·7
S_1: Beef-tea, bovril, or clear soup. (Black coffee.)	S_2: Tea or coffee + 1 teasp. thin cream. 1 oz. white fish. 2 oz. boiled veg., Group I. 2 bran biscuits.	S_3: Clear soup. 1 oz. salad, Group I. 1 oz. chicken or Group X. 2 "Akoll" biscuits.	S_4: Soup. 4 oz. fish. 3 oz. veg., Group I. ½ hard-boiled egg. 2 "Akolls" + trace of butter.	S_5: Clear soup. 3 oz. Group X. 5 oz. veg., Group I. 3 "Akolls."
0 1 0 =4	2 5·6 0·5 = 34·9	1·2 11·3 5 = 95	3·2 28·9 6 =182·4	5·3 26·5 12 =235·2
∴ D_1 =0 2 0 =8	D_2 =6 21·3 7·5 =176·7	D_3 =9·4 43·7 10 =302·4	D_4 =13·3 98·3 19 =617·4	D_5 =27·1 113·4 43·5 =953·5
B_6: Tea + 1 tablesp. milk. 2 oz. oatmeal porridge. 1 tablesp. milk. 2 eggs + ½ oz. bacon. 2 "Akolls" + trace of butter.	B_7: Tea + 1 tablesp. milk. 2 oz. oatmeal porridge. 1 tablesp milk. 2 eggs + 1 oz. bacon. 2 "Akolls" + trace of butter.	B_8: Tea + 2 tablesp. milk. 2 eggs + 2 oz. bacon. ½ oz. bread + 2 "Akolls." ½ oz. butter.	B_9: Tea + 2 tablesp. milk. 3 oz. mod. fat ham or Group Z. 1 egg. 1 oz. bread + ½ oz. butter.	B_{10}: Tea + 2 tablesp. milk. 2 eggs + 2 oz. bacon. 1½ oz. bread (or 4½ oz. mod. thin porridge). ½ oz. butter.
10·4 20·6 24 =340	10·2 22·6 32 =419·2	8·2 26·2 59 =668·6	14·6 21·4 46 =558	21·2 24·6 57 =696·2
L_6: Soup. 4 oz. Group X. 6 oz. veg., Group I. 1½ oz. potato. 2 "Akolls" + ½ oz. butter. + ½ oz. cheese.	L_7: Soup. 5 oz. Group Y. 6 oz. Group I. 1½ oz. potato. 2 "Akolls" + ½ oz. butter. ½ oz. cheese.	L_8: Soup. 4 oz. Group Z. 6 oz. Group I. 1½ oz. potato. 3 "Akolls" + ½ oz. butter. 1½ oz. cheese.	L_9: Soup. 4 oz. Group Y. 6 oz. Group I. 2 oz. potato. 2 "Akolls" + ½ oz. butter. 1½ oz. cheese.	L_{10}: Soup. 5 oz. Group Y + 6 oz. Group I. 1½ oz. potato + 1½ oz. bread. 1½ oz. cheese + 1 oz. butter. (Black coffee.)
12·8 35·5 30·5 =467·7	12·8 36·5 37·5 =534·7	12·9 36·5 70·5 =832·1	15·0 38·9 53·5 =697·1	32·4 43·1 62·5 =864·5
T_6: Tea + 1 tablesp. milk. 3 "Akolls" + trace of butter. 2 eggs. 1 oz. orange or fruit from Group III.	T_7: Tea + 1 tablesp. milk. ½ oz. bread + 3 "Akolls." ½ oz. butter. 2 eggs.	T_8: Tea + 2 tablesp. milk. 2 oz. fish + ½ oz. butter. ½ oz. bread + 3 "Akolls" + 1 oz. butter.	T_9: Tea + 2 tablesp. milk. 1 oz. bread, ½ oz. butter, 2 eggs (= 2 poached eggs on toast).	T_{10}: Tea + 2 tablesp. milk. 3 oz. fish + ½ oz. butter. 1 oz. bread + ½ oz. butter.
4 18·8 15·5 =239·7	7·6 19·7 27·5 =356·7	8·3 18·2 40 =466	14·6 15·4 25 =345	14·6 18·4 31 =411
S_6: Soup. 4 oz. fish. 1½ oz. potato. 4 oz. veg., Group I. 2 "Akolls" + ½ oz. butter. (Black coffee.)	S_7: Soup. 4 oz. Group Y. 1 oz. potato. 4 oz. Group I. 1 "Akoll" + ½ oz. cheese.	S_8: Soup. 3 oz. Group Y. 3 oz. Group I. ½ oz. bread. 3 "Akolls" + 1 oz. butter. 1½ oz. cheese.	S_9: Soup. 4 oz. fish + ½ oz. butter. 1 oz. bread + 2 "Akolls." 1 oz. cheese + ½ oz. butter.	S_{10}: Tea or coffee + 2 tablesp. milk. 3 oz. corned beef or Group Z. ½ oz. bread + ½ oz. butter. 1 oz. cheese.
10·8 27·4 14 =278·8	8·5 28·5 25·5 =377·5	9·9 32·6 55·5 =669·5	13·4 34·1 47 =614·2	11·3 21·8 49 =573·4
D_6 =38 102·3 85 =1226·2	D_7 =39·1 107·3 122·5 =1688·1	D_8 =39·3 113·5 225 =2636·2	D_9 =57·6 110·1 171·5 =2214·3	D_{10} =79·5 107·9 199·5 =2545·1

Note.—(*a*) The figures underneath each meal = g. C., P., and F., in this order, followed by the total number of calories in the meal. (*b*) B, L, T, S, and D are described in the text. (*c*) All food shown above is ready for consumption. (*d*) Bran biscuits may be obtained from Messrs. Callard and Co., Regent-street, London; "Akoll" biscuits from Messrs. Huntley and Palmer, Reading.

DIAGNOSIS AND TREATMENT OF DIABETES MELLITUS IN HOSPITAL AND GENERAL PRACTICE.

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(Concluded from p. 1314.)

Food Values.

THE following list of food values (Table I.) has been compiled from the U.S. Government Reports (1906 and 1913), and the works of Joslin, Atwater and Bryant, Street, McKillop, and others. To facilitate dieting, the value of the foods when ready for use are alone given. In view of the fact that the various authorities often differ a little in their analyses, the figures for certain foodstuffs have been selected, within the range of variation, so as to permit of the formation of groups of equivalents. The values, which can never be more than approximate, are sufficiently accurate for practical purposes. The simplicity and usefulness of the table from the standpoint of doctor, nurse, and patient are obvious.

The immediate aim of dietetic treatment is to provide the patient with sufficient nourishment for health, and at the same time keep the urine free from sugar and any appreciable amount of acetone bodies.

TABLE I.

Grammes of carbohydrate, protein, and fat in 1 oz. of the following (ready for consumption):—

1 oz. of:	C.(g.)	P.(g.)	F.(g.)
"x" Beef: rump, loin, tongue, lean (cooked). Chicken (cooked). Herring (cooked). Liver (cooked). Kidney (cooked). Salmon (boiled)	—	6	3
"y" Mutton or lamb: leg or shoulder (boiled or roast). Veal (cooked). Turkey (cooked). Sausage (Bologna, Frankfort). Sardines (tinned). Salmon (tinned). Ham, lean (smoked or boiled)	—	5	5
"z" Beef: fat (cooked). Mutton or lamb, moderately fat (cooked). Ham, moderately fat (smoked or boiled). Pork: loin, ribs, or shoulder (cooked). Sausage, pork. Beef (corned)	—	4	9
Cheese: Cheddar, Cheshire, Roquefort, Swiss, Cream, Stilton	—	7	9
Bran biscuits (Callard and Co.)	—	—	—
Bacon, fat retained (fried)..	—	4	16
1 egg (=2 oz.; half of the protein and all the fat are in the yolk) .. .. .. =	—	6	6
Fish, white (boiled)	—	5	—
Clear soup or bovril or beef-tea (6–10 oz.)..	—	1	—
"Akoll" biscuits (Huntley and Palmer): each biscuit .. .. =	0·1	2	1
Butter or Margarine .. .. .. Lard .. .. Salad Oil	—	—	24
(p) Bread (brown or white)	13·2	2·4	—
(q) Rice (cooked, using a moderate amount of milk). Macaroni (ditto). Tapioca (ditto).. ..	6·6	1·2	—
(r) Potato (boiled). Oatmeal porridge, moderately thin	4·4	0·8	—
(s) Sago (cooked, using little milk). Semolina (ditto). Farola (ditto)	3·3	0·6	—
Almonds, brazil nuts, walnuts	3	5	17
Milk (whole)	1·4	1	1
,, (skimmed)	1·4	1	0·1
Cream (thin), 1 teaspoonful .. .. =	—	—	0·5
,, (thick), ,, ... =	—	—	1·5

Note.—(p) = 2 (q) = 3(r) = 4(s).

Vegetables and Fruits. (Based on Joslin's Tables.)

—	1 oz. contains approx.:		
	C.(g.)	P.(g.)	F.(g.)
GROUP I. Vegetables— Tomatoes, lettuce, watercress, endive, cabbage, celery, spinach, marrow, cauliflower, cucumber, sea-kale, Brussels sprouts, mushrooms, radishes, leeks, French beans, asparagus, broccoli, turnips, onions .. .. Fruits— Rhubarb, grape fruit	1	0·3	—
GROUP III. Vegetables— Green peas, carrots, beets, artichokes, water-melon .. .. Fruits— Oranges, fresh pineapple, peaches, apricots, strawberries, raspberries, cranberries, gooseberries. Apples and pears vary from 3-5 g. carboh.	3	0·3	—
GROUP V. Grapes, figs, plums, prunes, bananas (also canned pears, peaches, and pineapple)..	5	0·3	—

Note.—1. Values given are for the fresh article; if cooked, a little over-weight is allowed. 2. If boiled a second time, and in a change of water, half to two-thirds of these values should be taken. 3. The groups are labelled according to the amount of carbohydrate.

The amount of acetone bodies is considered appreciable when even a slight ferric chloride reaction is obtained; to avoid fallacy, care must be taken that the patient is not taking drugs, particularly those of the phenol class.

Some cases clear up in a remarkably short time on, first of all, withdrawing most of the fat in the diet and subsequently reducing the carbohydrate and protein, especially the former, to a point at which the urine ceases to be abnormal. The more usual method is to begin by fasting the patient—only clear soup, beef-tea, bovril, and unsweetened tea or coffee (without milk), or lemonade being allowed. One or two days of this treatment often suffices. If, at the end of the second day, sugar is still present it is advisable to allow a little nourishment for one or two days—mainly protein and carbohydrate, the latter in the form of group 1 vegetables, e.g., a diet containing about 5–10 g. carbohydrate, 20–25 g. protein, and 5–10 g. fat with tea, coffee, &c., "ad lib." as before. A further one or two days of fasting may still be required, but this is unusual. Should sugar even then be present, it is advisable steadily to increase the diet over a period of five or six days until, say, roughly half the requisite number of calories are being given; at this stage it is better to order rather more protein than fat. Another attempt to render the urine sugar-free by fasting may now be made. If unsuccessful, the patient ought to be given the diet which seems to have the most suitable distribution of foodstuffs and contains enough calories for health. Although the glycosuria, usually reduced in amount, continues in such cases, there is often considerable improvement in the general condition. Of course, insulin might have been used at any stage in the treatment to abolish the glycosuria and restore the blood-sugar to normal. When at all possible, insulin should be given to these patients, also to those in whom any considerable degree of ketonuria persists after the maximum of carbohydrate tolerance has been established.

Cases rendered sugar-free by fasting are given a gradually increasing dietary, built up on the lines just indicated, with a fast on every seventh day, until in the course of two or three weeks adequate nourishment is being taken. Should glycosuria reappear at any time, it is corrected by fasting for a day or so, and the scale of diets then continued. If it be impossible to give the required number of calories without glycosuria recurring, then again one must decide whether the glycosuria should be allowed to continue or whether insulin should be employed.

Prescription of Diets.

This is still the great stumbling-block to many practitioners. They recognise that in no two instances will the course of dieting, if correctly applied, be the same; the amounts of carbohydrate, protein, and fat in the diet will vary according to the several defects of metabolism present. Furthermore, if insulin be given, the distribution of the carbohydrate, protein, and fat over the 24 hours must be correlated with the time or times of its administration and the dosage. The patient's likes and dislikes in the matter of food also demand attention. It is clearly impossible to solve the problem by constructing 24-hour diet-charts to meet every contingency. On the other hand, one may daily, or from time to time, prescribe the meals in detail, so as to conform to the changes in metabolism and the needs of the patient; this would be ideal for

TABLE II.—*A* (*Specimen*) *System of Diets.*

B_1: Tea or coffee ad lib. (without milk or sugar).	B_2: Tea or coffee + 1 teasp. thin cream. 1 oz. veg., Group I. ½ hard-boiled egg. 1–2 bran biscuits.	B_3: Tea + 1 teasp. thin cream. 2 oz. veg., Group I. 2 oz. fish. 1–2 bran biscuits with a trace of butter (= 1 g. F.).	B_4: Tea + 1 tablesp. milk. 4 oz. fish. 2 oz. salad, Group I. 2 "Akolls."	B_5: Tea + 2 tablesp. milk. 3 oz. fish. 1 egg and ½ oz. bread. 2 "Akolls" + a trace of butter.
0 0 0 =0	1 3·3 3·5 =48·7	2 10·6 1·5 =63·9	2·9 25·1 2·5 =134·5	8·2 27·2 10 =231·6
L_1: Beef-tea, bovril, or clear soup. (Black coffee or unsweetened lemonade.)	L_2: Clear soup or beef-tea. 1½ oz. white fish. 2 oz. boiled veg., Group I. 2 bran biscuits.	L_3: Clear soup or beef-tea. 3 oz. fish. 4 oz. boiled veg., Group I. 2 bran biscuits with a trace of butter.	L_4: Clear soup. 5 oz. fish. 4 oz. boiled veg., Group I. 3 "Akolls" + a trace of butter.	L_5: Soup or bovril. 5 oz., Group X. 5 oz. veg., Group I. 1 oz. potato. 3 "Akolls."
0 1 0 =4	2 9·1 0 =44·4	4 17·2 1 =93·8	4·3 33·2 4 =186	9·7 39·3 18 =358
T_1: Tea or coffee (without milk or sugar).	T_2: Tea + 1 teasp. thin cream. 1 oz. veg., Group I. ½ hard-boiled egg. 1 bran biscuit.	T_3: Tea + 1 teasp. thin cream. 2 oz. salad, Group I. 2 "Akoll" biscuits.	T_4: Tea + 1 tablesp. milk. 2 oz. salad, Group I. 1 oz. chicken or Group X. 2 "Akolls" + trace of butter.	T_5: Tea + 1 tablesp. milk. 3 oz. fish. 3 oz. salad, Group I. 2 "Akolls" + trace of butter.
0 0 0 =0	1 3·3 3·5 =48·7	2·2 4·6 2·5 =49·7	2·9 11·1 6·5 =114·5	3·9 20·4 3·5 =128·7
S_1: Beef-tea, bovril, or clear soup. (Black coffee.)	S_2: Tea or coffee + 1 teasp. thin cream. 1 oz. white fish. 2 oz. boiled veg., Group I. 2 bran biscuits.	S_3: Clear soup. 1 oz. salad, Group I. 1 oz. chicken or Group X. 2 "Akoll" biscuits.	S_4: Soup. 4 oz. fish. 3 oz. veg., Group I. ½ hard-boiled egg. 2 "Akolls" + trace of butter.	S_5: Clear soup. 3 oz. Group X. 5 oz. veg., Group I. 3 "Akolls."
0 1 0 =4	2 5·6 0·5 = 34·9	1·2 11·3 5 = 95	3·2 28·9 6 =182·4	5·3 26·5 12 =235·2
∴ D_1 =0 2 0 =8	D_2 =6 21·3 7·5 =176·7	D_3 =9·4 43·7 10 =302·4	D_4 =13·3 98·3 19 =617·4	D_5 =27·1 113·4 43·5 =953·5
B_6: Tea + 1 tablesp. milk. 2 oz. oatmeal porridge. 1 tablesp. milk. 2 eggs + ½ oz. bacon. 2 "Akolls" + trace of butter.	B_7: Tea + 1 tablesp. milk. 2 oz. oatmeal porridge. 1 tablesp milk. 2 eggs + 1 oz. bacon. 2 "Akolls" + trace of butter.	B_8: Tea + 2 tablesp. milk. 2 eggs + 2 oz. bacon. ½ oz. bread + 2 "Akolls." ½ oz. butter.	B_9: Tea + 2 tablesp. milk. 3 oz. mod. fat ham or Group Z. 1 egg. 1 oz. bread + ½ oz. butter.	B_{10}: Tea + 2 tablesp. milk. 2 eggs + 2 oz. bacon. 1½ oz. bread (or 4½ oz. mod. thin porridge). ½ oz. butter.
10·4 20·6 24 =340	10·2 22·6 32 =419·2	8·2 26·2 59 =668·6	14·6 21·4 46 =558	21·2 24·6 57 =696·2
L_6: Soup. 4 oz. Group X. 6 oz. veg., Group I. 1½ oz. potato. 2 "Akolls" + ½ oz. butter. + ½ oz. cheese.	L_7: Soup. 5 oz. Group Y. 6 oz. Group I. 1½ oz. potato. 2 "Akolls" + ¾ oz. butter. ½ oz. cheese.	L_8: Soup. 4 oz. Group Z. 6 oz. Group I. 1½ oz. potato. 3 "Akolls" + ¾ oz. butter. 1½ oz. cheese.	L_9: Soup. 4 oz. Group Y. 6 oz. Group I. 2 oz. potato. 2 "Akolls" + ¾ oz. butter. 1½ oz. cheese.	L_{10}: Soup. 5 oz. Group Y + 6 oz. Group I. 1½ oz. potato + 1½ oz. bread. 1½ oz. cheese + 1 oz. butter. (Black coffee.)
12·8 35·5 30·5 =467·7	12·8 36·5 37·5 =534·7	12·9 36·5 70·5 =832·1	15·0 38·9 53·5 =697·1	32·4 43·1 62·5 =864·5
T_6: Tea + 1 tablesp. milk. 3 "Akolls" + trace of butter. 2 eggs. 1 oz. orange or fruit from Group III.	T_7: Tea + 1 tablesp. milk. ½ oz. bread + 3 "Akolls." ½ oz. butter. 2 eggs.	T_8: Tea + 2 tablesp. milk. 2 oz. fish + ½ oz. butter. ½ oz. bread + 3 "Akolls" + 1 oz. butter.	T_9: Tea + 2 tablesp. milk. 1 oz. bread, ½ oz. butter, 2 eggs (= 2 poached eggs on toast).	T_{10}: Tea + 2 tablesp. milk. 3 oz. fish + ½ oz. butter. 1 oz. bread + ½ oz. butter.
4 18·8 16·5 =239·7	7·6 19·7 27·5 =356·7	8·3 18·2 40 =466	14·6 15·4 25 =345	14·6 18·4 31 =411
S_6: Soup. 4 oz. fish. 1½ oz. potato. 4 oz. veg., Group I. 2 "Akolls" + ½ oz. butter. (Black coffee.)	S_7: Soup. 4 oz. Group Y. 1 oz. potato. 4 oz. Group I. 1 "Akoll" + ½ oz. cheese.	S_8: Soup. 3 oz. Group Y. 3 oz. Group I. ½ oz. bread. 3 "Akolls" + 1 oz. butter. 1½ oz. cheese.	S_9: Soup. 4 oz. fish + ½ oz. butter. 1 oz. bread + 2 "Akolls." 1 oz. cheese + ½ oz. butter.	S_{10}: Tea or coffee + 2 tablesp. milk. 3 oz. corned beef or Group Z. ½ oz. bread + ½ oz. butter. 1 oz. cheese.
10·8 27·4 14 =278·8	8·5 28·5 25·5 =377·5	9·9 32·6 55·5 =669·5	13·4 34·4 47 =614·2	11·3 21·8 49 =573·4
D_6 =38 102·3 85 =1326·2	D_7 =39·1 107·3 122·5 =1688·1	D_8 =39·3 113·5 225 =2636·2	D_9 =57·6 110·1 171·5 =2214·3	D_{10} =79·5 107·9 199·5 =2545·1

Note.—(*a*) The figures underneath each meal = g. C., P., and F., in this order, followed by the total number of calories in the meal. (*b*) B., L., T., S., and D. are described in the text. (*c*) All food shown above is ready for consumption. (*d*) Bran biscuits may be obtained from Messrs. Callard and Co., Regent-street, London; "Akoll" biscuits from Messrs. Huntley and Palmer, Reading.

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Food Values.

The following list of food values (Table I.) has been compiled from the U.S. Government Reports (1906 and 1913), and the works of Joslin, Atwater and Bryant, Street, McKillop, and others. To facilitate dieting, the value of the foods when ready for use are alone given. In view of the fact that the various authorities often differ a little in their analyses, the figures for certain foodstuffs have been selected, within the range of variation, so as to permit of the formation of groups of equivalents. The values, which can never be more than approximate, are sufficiently accurate for practical purposes. The simplicity and usefulness of the table from the standpoint of doctor, nurse, and patient are obvious.

The immediate aim of dietetic treatment is to provide the patient with sufficient nourishment for health, and at the same time keep the urine free from sugar and any appreciable amount of acetone bodies.

TABLE I.

Grammes of carbohydrate, protein, and fat in 1 oz. of the following (ready for consumption):—

1 oz. of:	C.(g.)	P.(g.)	F.(g.)
"x" Beef: rump, loin, tongue, lean (cooked). Chicken (cooked). Herring (cooked). Liver (cooked). Kidney (cooked). Salmon (boiled)	—	6	3
"y" Mutton or lamb: leg or shoulder (boiled or roast). Veal (cooked). Turkey (cooked). Sausage (Bologna, Frankfort). Sardines (tinned). Salmon (tinned). Ham, lean (smoked or boiled)	—	5	5
"z" Beef: fat (cooked). Mutton or lamb, moderately fat (cooked). Ham, moderately fat (smoked or boiled). Pork: loin, ribs, or shoulder (cooked). Sausage, pork. Beef (corned)	—	4	9
Cheese: Cheddar, Cheshire, Roquefort, Swiss, Cream, Stilton	—	7	9
Bran biscuits (Callard and Co.)	—	—	—
Bacon, fat retained (fried)..	—	4	16
1 egg (=2 oz.; half of the protein and all the fat are in the yolk) .. .. .. =	—	6	6
Fish, white (boiled)	—	5	—
Clear soup or bovril or beef-tea (6–10 oz.)..	—	1	—
"Akoll" biscuits (Huntley and Palmer): each biscuit .. .. =	0·1	2	1
Butter or Margarine .. .. .. Lard .. .. Salad Oil	—	—	24
(p) Bread (brown or white)	13·2	2·4	—
(q) Rice (cooked, using a moderate amount of milk). Macaroni (ditto). Tapioca (ditto).. ..	6·6	1·2	—
(r) Potato (boiled). Oatmeal porridge, moderately thin	4·4	0·8	—
(s) Sago (cooked, using little milk). Semolina (ditto). Farola (ditto)	3·3	0·6	—
Almonds, brazil nuts, walnuts	3	5	17
Milk (whole)	1·4	1	1
,, (skimmed)	1·4	1	0·1
Cream (thin), 1 teaspoonful .. .. =	—	—	0·5
,, (thick), ,, ... =	—	—	1·5

Note.—(p) = 2 (q) = 3(r) = 4(s).

Vegetables and Fruits. (Based on Joslin's Tables.)

—	1 oz. contains approx.:		
	C.(g.)	P.(g.)	F.(g.)
GROUP I.			
Vegetables— Tomatoes, lettuce, watercress, endive, cabbage, celery, spinach, marrow, cauliflower, cucumber, sea-kale, Brussels sprouts, mushrooms, radishes, leeks, French beans, asparagus, broccoli, turnips, onions .. .. Fruits— Rhubarb, grape fruit	1	0·3	—
GROUP III.			
Vegetables— Green peas, carrots, beets, artichokes, water-melon .. .. Fruits— Oranges, fresh pineapple, peaches, apricots, strawberries, raspberries, cranberries, gooseberries. Apples and pears vary from 3–5 g. carboh.	3	0·3	—
GROUP V.			
Grapes, figs, plums, prunes, bananas (also canned pears, peaches, and pineapple)..	5	0·3	—

Note.—1. Values given are for the fresh article; if cooked, a little over-weight is allowed. 2. If boiled a second time, and in a change of water, half to two-thirds of these values should be taken. 3. The groups are labelled according to the amount of carbohydrate.

The amount of acetone bodies is considered appreciable when even a slight ferric chloride reaction is obtained; to avoid fallacy, care must be taken that the patient is not taking drugs, particularly those of the phenol class.

Some cases clear up in a remarkably short time on, first of all, withdrawing most of the fat in the diet and subsequently reducing the carbohydrate and protein, especially the former, to a point at which the urine ceases to be abnormal. The more usual method is to begin by fasting the patient—only clear soup, beef-tea, bovril, and unsweetened tea or coffee (without milk), or lemonade being allowed. One or two days of this treatment often suffices. If, at the end of the second day, sugar is still present it is advisable to allow a little nourishment for one or two days—mainly protein and carbohydrate, the latter in the form of group 1 vegetables, e.g., a diet containing about 5–10 g. carbohydrate, 20–25 g. protein, and 5–10 g. fat with tea, coffee, &c., "ad lib." as before. A further one or two days of fasting may still be required, but this is unusual. Should sugar even then be present, it is advisable steadily to increase the diet over a period of five or six days until, say, roughly half the requisite number of calories are being given; at this stage it is better to order rather more protein than fat. Another attempt to render the urine sugar-free by fasting may now be made. If unsuccessful, the patient ought to be given the diet which seems to have the most suitable distribution of foodstuffs and contains enough calories for health. Although the glycosuria, usually reduced in amount, continues in such cases, there is often considerable improvement in the general condition. Of course, insulin might have been used at any stage in the treatment to abolish the glycosuria and restore the blood-sugar to normal. When at all possible, insulin should be given to these patients, also to those in whom any considerable degree of ketonuria persists after the maximum of carbohydrate tolerance has been established.

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TABLE II.—*A (Specimen) System of Diets.*

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"y" Mutton or lamb: leg or shoulder (boiled or roast). Veal (cooked). Turkey (cooked). Sausage (Bologna, Frankfort). Sardines (tinned). Salmon (tinned). Ham, lean (smoked or boiled)	—	5	5
"z" Beef: fat (cooked). Mutton or lamb, moderately fat (cooked). Ham, moderately fat (smoked or boiled). Pork: loin, ribs, or shoulder (cooked). Sausage, pork. Beef (corned)	—	4	9
Cheese: Cheddar, Cheshire, Roquefort, Swiss, Cream, Stilton	—	7	9
Bran biscuits (Callard and Co.)	—	—	—
Bacon, fat retained (fried)..	—	4	16
1 egg (=2 oz.; half of the protein and all the fat are in the yolk) .. .. .. =	—	6	6
Fish, white (boiled)	—	5	—
Clear soup or bovril or beef-tea (6–10 oz.)..	—	1	—
"Akoll" biscuits (Huntley and Palmer): each biscuit .. .. =	0·1	2	1
Butter or Margarine .. .. .. Lard .. .. Salad Oil	—	—	24
(p) Bread (brown or white)	13·2	2·4	—
(q) Rice (cooked, using a moderate amount of milk). Macaroni (ditto). Tapioca (ditto).. ..	6·6	1·2	—
(r) Potato (boiled). Oatmeal porridge, moderately thin	4·4	0·8	—
(s) Sago (cooked, using little milk). Semolina (ditto). Farola (ditto)	3·3	0·6	—
Almonds, brazil nuts, walnuts	3	5	17
Milk (whole)	1·4	1	1
,, (skimmed)	1·4	1	0·1
Cream (thin), 1 teaspoonful .. .. =	—	—	0·5
,, (thick), ,, ... =	—	—	1·5

Note.—(p) = 2 (q) = 3(r) = 4(s).

Vegetables and Fruits. (*Based on Joslin's Tables.*)

—	1 oz. contains approx.:		
	C.(g.)	P.(g.)	F.(g.)
Group I. Vegetables— Tomatoes, lettuce, watercress, endive, cabbage, celery, spinach, marrow, cauliflower, cucumber, sea-kale, Brussels sprouts, mushrooms, radishes, leeks, French beans, asparagus, broccoli, turnips, onions .. .. Fruits— Rhubarb, grape fruit	1	0·3	—
Group III. Vegetables— Green peas, carrots, beets, artichokes, water-melon .. .. Fruits— Oranges, fresh pineapple, peaches, apricots, strawberries, raspberries, cranberries, gooseberries. Apples and pears vary from 3–5 g. carboh.	3	0·3	—
Group V. Grapes, figs, plums, prunes, bananas (also canned pears, peaches, and pineapple)..	5	0·3	—

Note.—1. Values given are for the fresh article; if cooked, a little over-weight is allowed. 2. If boiled a second time, and in a change of water, half to two-thirds of these values should be taken. 3. The groups are labelled according to the amount of carbohydrate.

The amount of acetone bodies is considered appreciable when even a slight ferric chloride reaction is obtained; to avoid fallacy, care must be taken that the patient is not taking drugs, particularly those of the phenol class.

Some cases clear up in a remarkably short time on, first of all, withdrawing most of the fat in the diet and subsequently reducing the carbohydrate and protein, especially the former, to a point at which the urine ceases to be abnormal. The more usual method is to begin by fasting the patient—only clear soup, beef-tea, bovril, and unsweetened tea or coffee (without milk), or lemonade being allowed. One or two days of this treatment often suffices. If, at the end of the second day, sugar is still present it is advisable to allow a little nourishment for one or two days—mainly protein and carbohydrate, the latter in the form of group 1 vegetables, e.g., a diet containing about 5–10 g. carbohydrate, 20–25 g. protein, and 5–10 g. fat with tea, coffee, &c., "ad lib." as before. A further one or two days of fasting may still be required, but this is unusual. Should sugar even then be present, it is advisable steadily to increase the diet over a period of five or six days until, say, roughly half the requisite number of calories are being given; at this stage it is better to order rather more protein than fat. Another attempt to render the urine sugar-free by fasting may now be made. If unsuccessful, the patient ought to be given the diet which seems to have the most suitable distribution of foodstuffs and contains enough calories for health. Although the glycosuria, usually reduced in amount, continues in such cases, there is often considerable improvement in the general condition. Of course, insulin might have been used at any stage in the treatment to abolish the glycosuria and restore the blood-sugar to normal. When at all possible, insulin should be given to these patients, also to those in whom any considerable degree of ketonuria persists after the maximum of carbohydrate tolerance has been established.

Cases rendered sugar-free by fasting are given a gradually increasing dietary, built up on the lines just indicated, with a fast on every seventh day, until in the course of two or three weeks adequate nourishment is being taken. Should glycosuria reappear at any time, it is corrected by fasting for a day or so, and the scale of diets then continued. If it be impossible to give the required number of calories without glycosuria recurring, then again one must decide whether the glycosuria should be allowed to continue or whether insulin should be employed.

These mild symptoms usually disappear rapidly after giving a hot drink, or a portion of the food belonging to the next meal. The patient should not be encouraged to have immediate recourse to sugar on such slight provocation. It is most important, however, that sugar be always at hand in case of emergency. If the above measures do not suffice, or if the symptoms be more marked from the start, then ½–2 oz. glucose or cane sugar must be given at once by the mouth. Recovery takes place within 10–15 minutes. Should unconsciousness have supervened, or the patient be unable to swallow, ¾–1 c.cm. of 1 in 1000 adrenalin, or ¾–1 c.cm. pituitrin, injected hypodermically, will practically always bring the patient round sufficiently within five minutes to take sugar by the mouth. If these remedies are not available, or if they do not prove effective, sugar must without delay be given intravenously. From 20 to 100 c.cm. of a 20 per cent. solution of glucose may be required. If the intravenous route fails the sugar should be injected into the subcutaneous tissues. Brandy and hot drinks are of value when consciousness has been restored. With ordinary care, however, mishaps of this nature do not occur.

Any patient who is having insulin and going about his work should as a precaution, always carry in his pocket about half-a-dozen lumps of sugar; this is really imperative if the dose be 20 units or over.

Correlation of the Diet and the Dose of Insulin.—Some physicians begin treatment by fasting the patient for a few days, or by fasting plus insulin before proceeding gradually to build up a suitable diet with the help of this remedy. The majority, however, employ the simpler method of putting the patient immediately on a diet calculated to supply his wants, and then endeavouring to restore normal metabolism by cautiously increasing the daily dose of insulin, which at first is a small one. Each method has its points. In the first one the blood-sugar is more rapidly controlled but a sufficient dietary is more slowly reached, in the second a full dietary is given from the beginning, but the decline of the hyperglycæmia is relatively slow. Further, as regards the latter, it cannot be considered the best practice in some cases, especially those in which debility is marked and the appetite poor, suddenly to throw upon the system the burden of a comparatively large meal that cannot be properly utilised. Personally, I favour an intermediate course, in which the patient is started on a diet containing roughly two-thirds of his calorie requirements and the dose of insulin gradually increased until satisfactory results are obtained. From this point a diet, sufficient for health, is steadily built up, care being taken meanwhile that the desired insulin effect is maintained by regulation of the dose. Circumstances and common sense, however, will decide in any particular instance whether at first a full diet or a fraction of it is the more applicable. As the procedure is essentially the same in both, the method of using the initial full diet will, for sake of simplicity, only be described.

The duration of the action of insulin depends partly on the size of the dose and partly on the severity of the disease. It may, for practical purposes, be put at four to eight, or roughly six, hours. The dose or doses should be so arranged that at least the bulk of the day's food is covered thereby; this applies particularly to the carbohydrate portion. In a case of any severity it is better to begin with two injections per diem; sometimes three may be necessary. As improvement takes place it may be possible to arrange the dietary so that most of it comes under the influence of a single dose without the return of symptoms. Continued progress may permit of further reduction of insulin, perhaps even its complete withdrawal occasionally. When two doses are to be given it is best to order two major and one or two minor meals in the 24 hours—e.g., a relatively large breakfast and lunch at, say, 9 A.M. and 2 P.M.; a moderately small tea at 5 o'clock, and a very light supper at 8 o'clock; bovril may be taken at 11.30 A.M. When patients are at work and away from home during the lunch-hour, it will probably be found more convenient to arrange the diet so that little is taken at midday, a meal equivalent to lunch being allowed at tea-time on the patient's return home. Insulin, in initial doses of 5 units, is given half an hour before the two larger meals; in severe cases bigger doses—e.g., 10 units—may be required. The patient should rest in bed at the beginning of treatment, or at least he should stay within doors. The 24-hour urine should be tested daily for sugar and diacetic acid. If all goes well the insulin may be increased, say, at the rate of 5 units daily, or only every second, third, or fourth day, first of all adding to the dose before lunch and then to the one before breakfast. The immediate object in view is to cause a gradual disappearance of sugar from the urine. Any single dose ought not to exceed 30 units. The effect of insulin in controlling hyperglycæmia is enhanced by reducing the carbohydrate intake and vice versa. When only one dose is indicated I find it is best to order a very light breakfast, a lunch containing almost half of the food for the 24 hours, a tea three and a half hours later, containing about one-third of the diet, and a light supper four hours afterwards; the injection is given before lunch. If insulin be discontinued, the three or four meals should be made nearly equal in food value and the interval longer than usual.

If glycosuria has been so reduced that only a small amount of sugar remains, it is valuable in the absence of blood-sugar estimations, and especially when large doses of insulin are being used, to test for sugar in the urine collected over the two hours preceding each injection. A sugar-free specimen should be an indication to proceed more carefully; it may even be advisable slightly to reduce the dosage if this be large. A 24-hour specimen free from sugar means that much has been accomplished for the patient, and the practitioner may be content to adjust the dose of insulin so that the condition just borders on glycosuria. If, however, he would secure the best results he must try to reduce the blood-sugar to a normal level. This may be effected safely by continuing the dose which had gradually freed the urine of sugar, strict watch being kept for the initial symptoms of hypoglycæmia. If none of these present themselves within four to five days, then the dose should be increased by a few units, say, every third or fourth day, until such symptoms just begin to appear. There is no danger in this procedure if the patient has been taught how to recognise and deal with the condition. The optimum dose is a little less than that which caused the symptoms. The latter may reappear as tolerance for carbohydrate improves; if so, more insulin is withdrawn.

It is, therefore, possible to treat diabetes quite satisfactorily without blood-sugar estimations, and by proceeding on these lines even the busiest practitioner can readily employ insulin with every prospect of success. The blood-tests, however, permit of a more rapid and more accurate adjustment of dosage, and consequently of an earlier and more effective rest for the pancreas. For this purpose estimations are best carried out before the first meal of the day, and three to hour hours after the injections.

The following is a brief example of the early part of the treatment advocated above:—

Patient, aged 30 years, weight 120 lb., under-nourished, urinary sugar 4 per cent., moderate degree of ketonuria. "fasting" blood-sugar in the morning 0·25 per cent., blood-sugar two hours after 20 g. glucose 0·35 per cent.

Calorie requirement (resting or at light work) = 120 × 13 = 1560 calories. A little in excess of this is ordered because the patient appears to be under-nourished. The diet as shown in Table IV. was therefore allowed.

Five units of insulin were given before breakfast and before lunch and the dose gradually increased, as described, until glycosuria was abolished and the sugar-content of the blood lowered to within normal

the patient, but calculations, &c., make it laborious for the doctor.

I have adopted a scheme of dieting which, used in conjunction with the foregoing table of "food values," has proved of great help in treating patients, both in and out of hospital. (Table II.) Menus of a number of so-called "basal" breakfasts (B_1, B_2, B_3, &c.), lunches (L_1, L_2, &c.), teas (T_1, &c.), and suppers (S_1, &c.) have been drawn up; these contain varying quantities of carbohydrate, protein, and fat. (See "System of Diets.") A dietary consisting of B_1, L_1, T_1, S_1 constitutes a 24-hour fast; for convenience the fasting diet may be referred to as D_1. Similarly, one may speak of D_2, D_3, D_4, &c.; the latter, however, are not intended to be regarded as whole-day diets, though *some* may be used as such. Of the basal breakfasts, lunches, &c., any number may be employed. Personally, I make use of 14 sets, but owing to lack of space only ten are shown. The latter will probably suffice, however, in most cases—at any rate, they serve to illustrate the principle of the method. Now the number of different 24-hour diets (consisting of B, L, T, S) that can be selected from these sets $= 10^4 = 10{,}000$. A certain proportion of these would never be used, but taking into account the varied distribution of the diet with insulin therapy as described later, and the fact that lunches and suppers are interchangeable, also in some instances the breakfast and teas, I should think that 50 per cent. of them are capable of finding an application at some time or other.

The following is an example of a prescription: B_6, L_8, T_4, S_7. In the formula B_6, L_8, T_4, L_6, the L_6 is being used as a supper. *Additional amounts of carbohydrates, protein, and fat may be added to these basal meals without involving more than a momentary calculation.* For out-patient work or in general practice it is convenient to have the various meals printed on separate slips of paper—the patient is simply handed the requisite B, L, T, S slips and a printed list of the groups of foodstuffs, while the formula, with its values, is recorded in the notes of the case (Table III.).

TABLE III.

—	C.	P.	F.	Calories.
B_6 .. =	10·4	20·6	24·0	= 340·0
L_8 .. =	12·9	36·5	70·5	= 832·1
T_4 .. =	2·9	11·1	6·5	= 114·5
S_7 .. =	8·5	28·5	25·5	= 377·5
Total =	34·7	96·7	126·5	= 1664·1

Insulin Treatment.

We now come to the class of case—Class A, previously described—in which insulin is of outstanding value. In such, insulin treatment should be commenced without delay, especially in A (1), A (3), and A (4). The insulin, given hypodermically, compensates for the deficiency of pancreatic hormone, and in this way the metabolism of carbohydrate and fat is, more or less, restored to normal. As already stated, the aim of treatment should be to rest the islet cells as much as possible by keeping the blood-sugar concentration at, or near, the fasting level, and simultaneously to provide nourishment sufficient for the needs of the body. Those cells which are not irreparably damaged, or those which are merely overworked by defect of the remainder, are thus given the best chance of recovery. As tolerance for carbohydrates returns the dose of insulin can be reduced. I have evidence to show that in certain acute cases, obtained at an early stage, tolerance may recover to such an extent that insulin can be dispensed with. On the other hand, the damage may be so complete and so extensive that, in order to maintain health, a certain minimum of insulin must be given, as far as we know, indefinitely. Its use in diabetic coma will be considered separately. *Insulin may be employed quite safely in general practice* provided that: (*a*) One proceeds carefully and gradually in the matter of dosage, especially after the disappearance of sugar from the urine; (*b*) the patient be taught thoroughly the symptoms of overdosage, and that he or she always have at hand the means of counteracting the condition.

It must be emphasised that an overdose may result in death. Generally speaking, diabetics are more sensitive to the action of insulin than normal people, and some diabetics are much more sensitive than others. It is for these reasons that care must be taken in administering the remedy.

Symptoms Produced by an Overdose of Insulin.—The sensitiveness of patients to insulin varies—some require only a small dose to produce a certain effect, while others require a relatively large one. The effects produced are associated with a lowering of the blood-sugar, and the extent to which this takes place before symptoms arise also varies. In the majority of persons, when the blood-sugar is lowered to the region of 0·05 per cent., the symptoms of what has been termed hypoglycæmia arise. In a few patients a decrease to 0·08 per cent. only may cause the condition, whereas in others, equally few, a percentage as low as 0·04, or even 0·03, may be necessary.

The most frequent symptoms are as follows: A feeling of uneasiness, fear, a sense of impending disaster, marked physical weakness, trembling, flushing of the face and sweating, sometimes followed by pallor—the latter especially in children, in whom also the pulse-rate is often increased. Diplopia, giddiness, numbness of the hands, face, and tongue, a feeling of constriction about the chest and throat, and hunger pain may also occur. In cases of greater severity there may be ataxic movements, incoherent speech, drowsiness, and, perhaps, a state of unconsciousness; even death may ensue. The unconscious state is alarming. As a rule it resembles deep sleep in which the breathing, pulse, and appearance are good and yet the patient cannot be roused. The milder symptoms generally herald its onset, but sometimes there is no warning.

Apropos of the concentration of blood-sugar at which hypoglycæmic symptoms appear, an interesting and rather singular experience which I had with one of my earlier cases on insulin treatment may be mentioned:—

> A man, aged 60 years, moderately well nourished, had been dieted for a number of years, and during this time had remained practically free from symptoms, but always had a certain amount of sugar in the urine. When I first examined him the urine contained 5 per cent. of sugar and a small amount of diacetic acid; the blood-sugar during the morning fast was 0·303 per cent. He was given 15 units of insulin 20 minutes before a breakfast containing 7 g. C., 15 g. P., and 12 g. F. Just as the blood was about to be tested three hours after the meal he noticed for the first time that his voice had become rather thick, and a few minutes later experienced considerable difficulty in forming his words, felt chilly, unsteady on his legs, and decidedly nervous; the blood-sugar at this period showed in two simultaneous samples a percentage of 0·15. About 10 g. of glucose were given immediately by the mouth. In 15 minutes he was all right again, the blood-sugar then being 0·188 per cent.

The probable explanation of this phenomenon is that the patient's system had, in the course of years, gradually adjusted itself to the high concentration of sugar in the blood, working at this level, in much the same way as the normal does at the level of 0·1 per cent. It is therefore not altogether surprising that a sudden lowering of this concentration should have produced the symptoms described. Subsequently the blood-sugar was lowered by easy stages to normal figures, not only without recurrence of the ill-effects, but with benefit to the patient. Accordingly in chronic cases one should guard against too rapid a fall of the blood-sugar.

Treatment of Hypoglycæmia.—Nothing more than the mildest symptoms will ever occur if the simple rules for insulin therapy described later be followed.

These mild symptoms usually disappear rapidly after giving a hot drink, or a portion of the food belonging to the next meal. The patient should not be encouraged to have immediate recourse to sugar on such slight provocation. It is most important, however, that sugar be always at hand in case of emergency. If the above measures do not suffice, or if the symptoms be more marked from the start, then ½–2 oz. glucose or cane sugar must be given at once by the mouth. Recovery takes place within 10–15 minutes. Should unconsciousness have supervened, or the patient be unable to swallow, ¼–1 c.cm. of 1 in 1000 adrenalin, or ¾–1 c.cm. pituitrin, injected hypodermically, will practically always bring the patient round sufficiently within five minutes to take sugar by the mouth. If these remedies are not available, or if they do not prove effective, sugar must without delay be given intravenously. From 20 to 100 c.cm. of a 20 per cent. solution of glucose may be required. If the intravenous route fails the sugar should be injected into the subcutaneous tissues. Brandy and hot drinks are of value when consciousness has been restored. With ordinary care, however, mishaps of this nature do not occur.

Any patient who is having insulin and going about his work should as a precaution, always carry in his pocket about half-a-dozen lumps of sugar; this is really imperative if the dose be 20 units or over.

Correlation of the Diet and the Dose of Insulin.—Some physicians begin treatment by fasting the patient for a few days, or by fasting plus insulin before proceeding gradually to build up a suitable diet with the help of this remedy. The majority, however, employ the simpler method of putting the patient immediately on a diet calculated to supply his wants, and then endeavouring to restore normal metabolism by cautiously increasing the daily dose of insulin, which at first is a small one. Each method has its points. In the first one the blood-sugar is more rapidly controlled but a sufficient dietary is more slowly reached, in the second a full dietary is given from the beginning, but the decline of the hyperglycæmia is relatively slow. Further, as regards the latter, it cannot be considered the best practice in some cases, especially those in which debility is marked and the appetite poor, suddenly to throw upon the system the burden of a comparatively large meal that cannot be properly utilised. Personally, I favour an intermediate course, in which the patient is started on a diet containing roughly two-thirds of his calorie requirements and the dose of insulin gradually increased until satisfactory results are obtained. From this point a diet, sufficient for health, is steadily built up, care being taken meanwhile that the desired insulin effect is maintained by regulation of the dose. Circumstances and common sense, however, will decide in any particular instance whether at first a full diet or a fraction of it is the more applicable. As the procedure is essentially the same in both, the method of using the initial full diet will, for sake of simplicity, only be described.

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It must be emphasised that an overdose may result in death. Generally speaking, diabetics are more sensitive to the action of insulin than normal people, and some diabetics are much more sensitive than others. It is for these reasons that care must be taken in administering the remedy.

Symptoms Produced by an Overdose of Insulin.—The sensitiveness of patients to insulin varies—some require only a small dose to produce a certain effect, while others require a relatively large one. The effects produced are associated with a lowering of the blood-sugar, and the extent to which this takes place before symptoms arise also varies. In the majority of persons, when the blood-sugar is lowered to the region of 0·05 per cent., the symptoms of what has been termed hypoglycæmia arise. In a few patients a decrease to 0·08 per cent. only may cause the condition, whereas in others, equally few, a percentage as low as 0·04, or even 0·03, may be necessary.

The most frequent symptoms are as follows: A feeling of uneasiness, fear, a sense of impending disaster, marked physical weakness, trembling, flushing of the face and sweating, sometimes followed by pallor—the latter especially in children, in whom also the pulse-rate is often increased. Diplopia, giddiness, numbness of the hands, face, and tongue, a feeling of constriction about the chest and throat, and hunger pain may also occur. In cases of greater severity there may be ataxic movements, incoherent speech, drowsiness, and, perhaps, a state of unconsciousness; even death may ensue. The unconscious state is alarming. As a rule it resembles deep sleep in which the breathing, pulse, and appearance are good and yet the patient cannot be roused. The milder symptoms generally herald its onset, but sometimes there is no warning.

Apropos of the concentration of blood-sugar at which hypoglycæmic symptoms appear, an interesting and rather singular experience which I had with one of my earlier cases on insulin treatment may be mentioned:—

A man, aged 60 years, moderately well nourished, had been dieted for a number of years, and during this time had remained practically free from symptoms, but always had a certain amount of sugar in the urine. When I first examined him the urine contained 5 per cent. of sugar and a small amount of diacetic acid; the blood-sugar during the morning fast was 0·303 per cent. He was given 15 units of insulin 20 minutes before a breakfast containing 7 g. C., 15 g. P., and 12 g. F. Just as the blood was about to be tested three hours after the meal he noticed for the first time that his voice had become rather thick, and a few minutes later experienced considerable difficulty in forming his words, felt chilly, unsteady on his legs, and decidedly nervous; the blood-sugar at this period showed in two simultaneous samples a percentage of 0·15. About 10 g. of glucose were given immediately by the mouth. In 15 minutes he was all right again, the blood-sugar then being 0·188 per cent.

The probable explanation of this phenomenon is that the patient's system had, in the course of years, gradually adjusted itself to the high concentration of sugar in the blood, working at this level, in much the same way as the normal does at the level of 0·1 per cent. It is therefore not altogether surprising that a sudden lowering of this concentration should have produced the symptoms described. Subsequently the blood-sugar was lowered by easy stages to normal figures, not only without recurrence of the ill-effects, but with benefit to the patient. Accordingly in chronic cases one should guard against too rapid a fall of the blood-sugar.

Treatment of Hypoglycæmia.—Nothing more than the mildest symptoms will ever occur if the simple rules for insulin therapy described later be followed.

These mild symptoms usually disappear rapidly after giving a hot drink, or a portion of the food belonging to the next meal. The patient should not be encouraged to have immediate recourse to sugar on such slight provocation. It is most important, however, that sugar be always at hand in case of emergency. If the above measures do not suffice, or if the symptoms be more marked from the start, then ½–2 oz. glucose or cane sugar must be given at once by the mouth. Recovery takes place within 10–15 minutes. Should unconsciousness have supervened, or the patient be unable to swallow, ¾–1 c.cm. of 1 in 1000 adrenalin, or ¼–1 c.cm. pituitrin, injected hypodermically, will practically always bring the patient round sufficiently within five minutes to take sugar by the mouth. If these remedies are not available, or if they do not prove effective, sugar must without delay be given intravenously. From 20 to 100 c.cm. of a 20 per cent. solution of glucose may be required. If the intravenous route fails the sugar should be injected into the subcutaneous tissues. Brandy and hot drinks are of value when consciousness has been restored. With ordinary care, however, mishaps of this nature do not occur.

Any patient who is having insulin and going about his work should as a precaution, always carry in his pocket about half-a-dozen lumps of sugar; this is really imperative if the dose be 20 units or over.

Correlation of the Diet and the Dose of Insulin.—Some physicians begin treatment by fasting the patient for a few days, or by fasting plus insulin before proceeding gradually to build up a suitable diet with the help of this remedy. The majority, however, employ the simpler method of putting the patient immediately on a diet calculated to supply his wants, and then endeavouring to restore normal metabolism by cautiously increasing the daily dose of insulin, which at first is a small one. Each method has its points. In the first one the blood-sugar is more rapidly controlled but a sufficient dietary is more slowly reached, in the second a full dietary is given from the beginning, but the decline of the hyperglycæmia is relatively slow. Further, as regards the latter, it cannot be considered the best practice in some cases, especially those in which debility is marked and the appetite poor, suddenly to throw upon the system the burden of a comparatively large meal that cannot be properly utilised. Personally, I favour an intermediate course, in which the patient is started on a diet containing roughly two-thirds of his calorie requirements and the dose of insulin gradually increased until satisfactory results are obtained. From this point a diet, sufficient for health, is steadily built up, care being taken meanwhile that the desired insulin effect is maintained by regulation of the dose. Circumstances and common sense, however, will decide in any particular instance whether at first a full diet or a fraction of it is the more applicable. As the procedure is essentially the same in both, the method of using the initial full diet will, for sake of simplicity, only be described.

The duration of the action of insulin depends partly on the size of the dose and partly on the severity of the disease. It may, for practical purposes, be put at four to eight, or roughly six, hours. The dose or doses should be so arranged that at least the bulk of the day's food is covered thereby; this applies particularly to the carbohydrate portion. In a case of any severity it is better to begin with two injections per diem; sometimes three may be necessary. As improvement takes place it may be possible to arrange the dietary so that most of it comes under the influence of a single dose without the return of symptoms. Continued progress may permit of further reduction of insulin, perhaps even its complete withdrawal occasionally. When two doses are to be given it is best to order two major and one or two minor meals in the 24 hours—e.g., a relatively large breakfast and lunch at, say, 9 A.M. and 2 P.M.; a moderately small tea at 5 o'clock, and a very light supper at 8 o'clock; bovril may be taken at 11.30 A.M. When patients are at work and away from home during the lunch-hour, it will probably be found more convenient to arrange the diet so that little is taken at midday, a meal equivalent to lunch being allowed at tea-time on the patient's return home. Insulin, in initial doses of 5 units, is given half an hour before the two larger meals; in severe cases bigger doses—e.g., 10 units—may be required. The patient should rest in bed at the beginning of treatment, or at least he should stay within doors. The 24-hour urine should be tested daily for sugar and diacetic acid. If all goes well the insulin may be increased, say, at the rate of 5 units daily, or only every second, third, or fourth day, first of all adding to the dose before lunch and then to the one before breakfast. The immediate object in view is to cause a gradual disappearance of sugar from the urine. Any single dose ought not to exceed 30 units. The effect of insulin in controlling hyperglycæmia is enhanced by reducing the carbohydrate intake and vice versa. When only one dose is indicated I find it is best to order a very light breakfast, a lunch containing almost half of the food for the 24 hours, a tea three and a half hours later, containing about one-third of the diet, and a light supper four hours afterwards; the injection is given before lunch. If insulin be discontinued, the three or four meals should be made nearly equal in food value and the interval longer than usual.

If glycosuria has been so reduced that only a small amount of sugar remains, it is valuable in the absence of blood-sugar estimations, and especially when large doses of insulin are being used, to test for sugar in the urine collected over the two hours preceding each injection. A sugar-free specimen should be an indication to proceed more carefully; it may even be advisable slightly to reduce the dosage if this be large. A 24-hour specimen free from sugar means that much has been accomplished for the patient, and the practitioner may be content to adjust the dose of insulin so that the condition just borders on glycosuria. If, however, he would secure the best results he must try to reduce the blood-sugar to a normal level. This may be effected safely by continuing the dose which had gradually freed the urine of sugar, strict watch being kept for the initial symptoms of hypoglycæmia. If none of these present themselves within four to five days, then the dose should be increased by a few units, say, every third or fourth day, until such symptoms just begin to appear. There is no danger in this procedure if the patient has been taught how to recognise and deal with the condition. The optimum dose is a little less than that which caused the symptoms. The latter may reappear as tolerance for carbohydrate improves; if so, more insulin is withdrawn.

It is, therefore, possible to treat diabetes quite satisfactorily without blood-sugar estimations, and by proceeding on these lines even the busiest practitioner can readily employ insulin with every prospect of success. The blood-tests, however, permit of a more rapid and more accurate adjustment of dosage, and consequently of an earlier and more effective rest for the pancreas. For this purpose estimations are best carried out before the first meal of the day, and three to hour hours after the injections.

The following is a brief example of the early part of the treatment advocated above:—

Patient, aged 30 years, weight 120 lb., under-nourished, urinary sugar 4 per cent., moderate degree of ketonuria. "fasting" blood-sugar in the morning 0·25 per cent., blood-sugar two hours after 20 g. glucose 0·35 per cent.

Calorie requirement (resting or at light work)= 120 × 13= 1560 calories. A little in excess of this is ordered because the patient appears to be under-nourished. The diet as shown in Table IV. was therefore allowed.

Five units of insulin were given before breakfast and before lunch and the dose gradually increased, as described, until glycosuria was abolished and the sugar-content of the blood lowered to within normal

limits. This result was attained when 10 units were being given before breakfast and 15 before lunch. Later, by rearrangement of the diet, one was enabled to reduce the number of injections to once daily (Table V.).

TABLE IV.

—	C.	P.	F.	Calories.
B_7 .. =	10·2	22·6	32·0	= 419·2
L_8 .. =	12·9	36·5	70·5	= 832·1
T_7 .. =	7·6	19·7	27·5	= 356·7
S_2 .. =	2·0	5·6	0·5	= 34·9
Total =	32·7	84·4	130·5	= 1642·9

TABLE V.

—	C.	P.	F.	Calories.
B_3 .. .. .. =	2·0	10·6	1·5	= 63·9
L_8 + ½ oz. bread .. =	19·5	37·7	70·5	= 863·3
T_8 .. .. .. =	8·3	18·2	40·0	= 466·0
S_3 + ½ oz. butter .. =	1·2	11·3	17·0	= 203·0
Total .. .. =	31·0	77·8	129·0	=1596·2

Insulin, 20 units, given before lunch controls both lunch and tea; breakfast and supper throw but little stress on the pancreas. It is hardly necessary to illustrate the method further. In instances when the patient is only able to afford a fraction of the required dose, or when the supply is restricted, it is better to give this amount than none at all; metabolism is thereby brought nearer to the normal.

Treatment of Diabetic Coma with Insulin.

The presence of sugar and diacetic acid in the urine in a case of coma is sufficient indication for the immediate use of insulin. An initial dose of 25 to 35 units should be given, and repeated in one and a half to two hours if there is not appreciable improvement. When possible, blood-sugar estimations ought to be made at intervals in order to observe the effect of insulin. On the one hand, it may be that enough is not being given, on the other, it is possible that the dose may prove so great that the coma passes imperceptibly into the unconscious stage of marked hypoglycæmia. Blood examinations are clearly of great value in conditions of this sort. Should their aid not be available, the question of giving sugar in order to guard against hypoglycæmia has to be carefully considered. In most cases the action of insulin is dramatic, the patient making a rapid and remarkable recovery. Even after consciousness has been regained close observation is essential, and a supply of adrenalin and sugar ought to be always at hand in case of emergency.

Instruction of the Patient.

The patient's future depends greatly on his intelligence and on his faithfulness to treatment. To gain his coöperation, he should be instructed in points such as the following:—

(*a*) *The nature of his disease.*

(*b*) The principle that treatment depends on diet and not on drugs.

(*c*) The meaning of carbohydrate, protein, and fat, and how each of these foodstuffs affects the disease.

(*d*) How to measure out diets. [He ought to provide himself with scales weighing to 10 oz., and a 10-oz. fluid measure. After a little experience the amounts may be gauged accurately enough without their use.]

(*e*) The method of rendering the urine *sugar-free.*

(*f*) The care of the teeth and skin.

(*g*) The testing of a specimen of the 24 hours' urine for sugar. This should be done daily or every other day. The following is a very simple method: Half fill a tablespoon (if test-tube not available) with Benedict's solution and add 10 drops of urine. Boil for two minutes; if no reduction during this process, set aside to cool for 3–4 minutes: a clear solution then means absence of sugar.

It may be necessary to teach the patient how to inject himself with insulin. Patients having insulin should know the symptoms of hypoglycæmia and how to act when they appear. If the blood-sugar is being kept at a low level by large doses, sleep should not be allowed within six hours following an injection. If the supply of insulin fails, the diet should be reduced by half; subsequently it may be raised to two-thirds.

3. PROGNOSIS.

No definite prognosis should be given until the patient's response to treatment has been thoroughly tested. This, taken in conjunction with the history of the case and the general condition of the patient, is the best guide to the severity of the disease or the degree of permanent damage. The significance of factors such as age, habit of body, duration of the disease, state of nutrition, and the amount of weight lost is well known, and will be taken into account.

Insulin has so revolutionised the treatment of cases both mild and severe, early and chronic, that we must allow the lapse of time before making any comprehensive statement on prognosis. As far as my experience goes, very early cases, with a clearly-defined onset, do remarkably well on insulin treatment, rigorously applied from the commencement. For example, in September last I treated a man, aged 20 years, who gave a history of the sudden onset of marked thirst, polyuria, and general weakness, beginning a week previously. The weight was normal and no infection could be found. Three per cent. sugar and much diacetic acid were found in the urine. The fasting blood-sugar was 0·176 per cent.; three-quarters of an hour after a small carbohydrate meal the percentage was 0·297, and at the two-hour period 0·261. After four days' insulin (10 units b.d.) and dietetic treatment the blood-sugar was normal. No reduction in the dose was made until five days later. During the course of the following three weeks the remedy was gradually, and at last completely, withdrawn. Since then, examinations at weekly intervals have not detected any sign of relapse. The daily allowance of carbohydrate is, however, still restricted, being only 65 g. Whether the patient would have developed the disease in any severity without insulin, or whether dietetic measures alone would have sufficed cannot be decided. The degree of liability to a recurrence of the trouble is also unknown.

Looked at from the standpoint of restoration of tolerance alone insulin greatly enhances the prospects for the patient by ensuring that the pancreas has a better chance of recovery than with purely dietetic measures. As regards ultimate results it is too early to speak. So far, experience suggests that a patient may be kept going indefinitely on insulin. In only three out of a series of 31 cases of mine treated for periods ranging from three to seven months has the disease appeared to be progressive once the blood-sugar has been properly controlled; one of the three was afflicted by a marked chronic nasal catarrh, which fact may partly explain the disappointing result.

The question which arises with the majority of patients, however, is whether or not the remedy may be partially or totally withdrawn after a time without a relapse. It is only by prolonged observation of the response to treatment that an answer can be arrived at. For some the problem resolves itself, more or less, into one of constant supply, while for others there is the encouragement of good results already obtained and the hope that, at most, only a small or occasional dose of insulin may eventually be required to protect the functioning islet tissue against extension or renewal of the disease.

Summary.

Special attention has been directed to: (*a*) The feasibility of diagnosing and treating diabetes mellitus without blood-sugar estimations. The value of the latter has been indicated. (*b*) The simplification of dietetic treatment.

In conclusion, I wish to express my sincere thanks to Prof. F. Langmead for much valuable advice, and for his kindness in allowing me to make use of his cases.

Clinical and Laboratory Notes.

HEPATIC ABSCESS AS A COMPLICATION OF APPENDICITIS.

BY E. G. SLESINGER, M.S. LOND., F.R.C.S. ENG.,
ASSISTANT SURGEON, GUY'S HOSPITAL.

THE case reported below is unusual in that after discharge of an appendicular abscess by the rectum for two years, hepatic abscess occurred, and in that although multiple infarction of the lung followed operation, a perfect recovery ultimately ensued.

H. B., male, aged 45, was first seen with Dr. T. Bowes, of Herne Bay, on June 26th, 1922.

History.—The history then obtained was as follows. Two years previously he had had an attack of acute intestinal obstruction, for which he was operated on, a mass of uncertain nature being found in the right iliac fossa. A lateral anastomosis of the terminal ileum to the ascending colon was performed. This partly relieved the obstruction, and shortly after an abscess burst into the rectum. Since that time, at varying intervals of from two weeks to two months, he had had attacks of pyrexia, abdominal pain, and pain on micturition, which lasted for a short time and were followed by the discharge of pus per rectum with relief, a state of affairs which had kept him more or less an invalid for two years. For the past two weeks he had been feeling very ill, with pyrexia and pain in the left epigastric region. This was quite different from the usual type of pain preceding the discharge of pus from the rectum. There was no history of dysentery and several examinations of the stools had proved negative.

Condition on Examination.—The patient looked ill and had marked clubbing of the fingers. There was dullness with greatly diminished breath sounds at the left base, rigidity of the upper part of the left rectus, dullness and a well-marked "cracked-pot" note over the front of the lower left ribs, and the liver felt slightly enlarged or pushed down. On rectal examination a large mass could be felt in Douglas's pouch. A provisional diagnosis of left subphrenic abscess was made.

Operation.—The next day, under an anæsthetic, the left base was needled in several places, but no pus or fluid was found. A high left paramedian incision was made and the subphrenic region was explored, but with negative result. The left lobe of the liver was seen to be congested and a needle was pushed in, pus being found at once. An incision into the liver opened an abscess cavity the size of a large egg-cup, filled with white odourless pus. This was drained with a large tube. The pus showed neither amœbæ nor actinomyces and remained sterile on culture. Bile discharged from the wound on the tenth day. Convalescence was very prolonged and was interrupted by repeated attacks of pulmonary infarction of the right lung, with spitting of first blood and later pus, and with high temperature and rigors. Gradually the condition improved, and the wound was fully healed [illegible] four months. Some cough and the usual abdominal [illegible] with discharge of pus from the rectum continued.

On Dec. 21st, 1922, he was again admitted with [illegible] clearing up the abdominal condition. X ray [illegible] showed the ileo-colostomy to be working well and [illegible] of the chest showed little except some darkening [illegible] side. On sigmoidoscopy marked œdema [illegible] mucosa, especially on the right side, was [illegible] actual sinus could be demonstrated. Dr. [illegible] examined the patient, found signs of [illegible] in the right lung. In spite of the [illegible] examinations of the stools, emetine [illegible] for ten days but with no effect.

On Jan. 4th, 1923, the abdomen [illegible] right paramedian incision. The [illegible] normal. A thick, rigid appendix [illegible] pelvic wall, was found and [illegible] Convalescence was rapid, and [illegible] his normal weight. [illegible] abdominal or chest symptoms [illegible] carrying on his duties [illegible] health.

Stillman, in a [illegible] found that comp[illegible] of these only [illegible] series of 2714 [illegible] various [illegible] occurred [illegible] reported [illegible]

only find 14 cases of liver abscess treated, with 12 recoveries, and they note that three of these were probably subphrenic. They record seven other cases. Since that date Bittner, Brogden, Le Petit, Frank, and Kelly have each had a recovery from this condition, so that records exist of 23 cases, of which 20 are known to have recovered after operative treatment. Many other cases, of course, were only recognised to have a solitary liver abscess on post-mortem examination.

It is of interest to note that the left lobe was very frequently the seat of the abscess in contra-distinction to the far greater frequency of right lobe infection in other solitary abscesses. The surprisingly high recovery-rate in these cases is, no doubt, partly due to the fact that only the patients with a relatively mild infection develop a solitary abscess, but in this connexion the work of Lemaire is also of interest. His experiments show that to a certain extent the liver offers a protection against a general infection with the *Bacillus coli communis*, and indicate that this office is performed by the endothelial cells of the hepatic capsule, purification taking place in a few hours if the infection is not too severe. This fact probably accounts for the sterility of the pus found at operation in my case and in several of the others.

AN UNUSUAL CASE OF PRIMARY CARCINOMA OF LIVER.

BY E. W. JOHNSON, L.R.C.P., [illegible]
SMITHDOWN-ROAD [illegible]

CARCINOMA of the liver is [illegible] primary. It is a disease [illegible] half the cases occurring [illegible] sixtieth years (Leich[illegible]). [illegible] occasionally occurs in children. [illegible] three varieties are [illegible] nodular, in which [illegible] throughout the [illegible] solitary [illegible] so-called [illegible] belongs [illegible] to be sufficient [illegible]

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[illegible] at the age of [illegible] of the finger [illegible] for admission [illegible] [illegible] finding long [illegible] [illegible] contracted [illegible] operation [illegible] from the [illegible] with a hollow [illegible] was [illegible] closed. [illegible]

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other was applicable to both eradicable and ineradicable cancer. It had a cauterising and coagulating effect on the diseased tissues, and also an antiseptic effect by which tissues surrounding the growth were sterilised of bacteria. He described the procedure he followed in cases of varying degrees in both categories.

Anastomosis of Facial and Recurrent Laryngeal Nerves with other Nerves.

Sir **CHARLES BALLANCE** communicated a preliminary note on results he had obtained in some experiments in which the facial and recurrent laryngeal nerves were anastomosed with other nerves. The research was carried out in conjunction with Mr. L. Colledge, Dr. Lionel Bell, Sir David Ferrier, and Prof. S. G. Shattock, the last-named until he was attacked by illness; the inquiry is still in progress. After end-to-end anastomosis of the recurrent laryngeal and the vagus, there was found to be no movement on tranquil respiration, therefore the object was not attained. But at the end of 15 months, when the wound was reopened and the vagus was stimulated above the point of anastomosis, the vocal cord abducted. Still, at the end of 18 months there was no cord movement on tranquil respiration, nor on asphyxiation, showing, therefore, that a partial degeneration of function had taken place, and hence the anastomosis could not be regarded as a physiological one. A similar sequel was observed of end-to-end anastomosis of the descendens noni with the recurrent laryngeal. But the phrenic nerve seemed a likely one. Therefore, this was divided and a divided recurrent laryngeal was united to it end-to-end. It was necessary to arrange for the nerve-supply of the diaphragm, therefore the distal end of the recurrent laryngeal was united end-to-end with the cut descendens noni. To prevent atrophy of the depressor muscles of the larynx and hyoid bone, the distal end of the descendens noni was anastomosed end-to-side with the hypoglossal. These depressor muscles of the hyoid bone were now acting normally, and their electrical reactions were normal; also the diaphragm was reported to be working normally through the descendens noni. With regard to the anastomosis between recurrent laryngeal and phrenic, at the end of a few months both cords were found to be acting normally and harmoniously, and a little later the anastomosed phrenic nerve was acting a little too vigorously; hence the experiment had overdone what was aimed at, perhaps because the recurrent laryngeal energised a much bigger muscle now than under natural circumstances. A further experiment was to anastomose the recurrent laryngeal to half the phrenic, and in another the fourth root was employed. The result was that he was satisfied that the phrenic nerve would energise and produce rhythmical movement of a vocal cord corresponding to the movement of the other cord.

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The communication was discussed by Sir **DAVID FERRIER**, Sir **FREDERICK MOTT**, Dr. **W. S. SYME**, and Sir **W. MILLIGAN**.

A large number of clinical cases were shown and discussed.

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Dr. **KERR LOVE** said that as an aid to treatment, tonsils and adenoids should be removed as soon as it was safe to do so—i.e., after the fever had subsided. The school authorities should not readmit a child with a running ear after an attack of either scarlet fever or measles. He believed that suggestions would be adopted by the County of Dumbarton and the City of Glasgow authorities.—Sir **WILLIAM MILLIGAN** said the time to take concerted action on this most important matter to the rising generation was long overdue. These destructive processes in the ear were a great handicap. Adenoids should be removed during the disease—i.e., as soon as the temperature came down; the removal should not be deferred until the patient was convalescent.—Mr. J. **ADAM** said that of 62 cases who developed otitis media only five required mastoid operation, which seemed to show that the tendency was for otitis media to get well if no operation was done.—Dr. **MCKENZIE** thought the mastoid should be operated upon more frequently in these cases of discharging ears. The question of secondary paracentesis should never arise.—Mr. **NEIL MACLAY** said that out of the large number of cases of scarlet fever admitted to the Newcastle Fever Hospital he had never seen the large devastating perforations which were described in the text-books. It was very difficult to anticipate the discharge by paracentesis, but efforts were made to cleanse mouth, fauces, and ears. Tonsils and adenoids, if prominent, were removed at an early period. Mr. J. S. **FRASER** agreed with Dr. McKenzie as to secondary paracentesis; he had never seen a secondary paracentesis do any good. He believed that if the rhinitis resulting from scarlet fever and measles were cured, much ozæna would be obviated in the future.—The discussion was continued by Mr. **HUGH JONES**, Dr. **SYDENHAM**, Mr. **BANKS-DAVIS**, Mr. **GILLESPIE**, Dr. F. W. **HARTOG**, Dr. A. D. **SHARP**, and Mr. J. F. **O'MALLEY**, and Mr. **LAYTON** replied.

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SECTION OF UROLOGY.

POLYCYSTIC DISEASE OF THE KIDNEY.

A MEETING of this section was held on June 26th, Dr. **LANGDON BROWN**, the President, being in the chair, when Dr. **PARKES WEBER** read a paper on the

So-called Myelin Kidney.

He explained that his interest was originally aroused in this subject by the numerous examples of opaque specks and streaks seen in the routine work of the post-mortem room. Some of these streaks were shown to be minute adenomata, others small cysts

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF LARYNGOLOGY AND OTOLOGY: SUMMER CONGRESS.

A SUMMER Congress of these sections in association was held at 1, Wimpole-street, London, on June 26th, 27th, and 28th, under the chairmanship of the respective section presidents, Mr. H. J. **BANKS-DAVIS** and Mr. **SYDNEY SCOTT**. Among the foreign visitors were Prof. R. Magnus and Dr. De Kleijn (Utrecht) and Dr. Hartog (The Hague); a dinner was held on the 27th, and river excursions took place on Sunday the 29th, the latter on the invitation of Mr. Irwin Moore.

Miss E. **LOWRY** read a paper on

Throat and Ear Defects of the Elementary School Child.

She pleaded for a more sympathetic attitude on this matter on the part of the profession as a whole. There was still no provision for the treatment of tonsils and adenoids in the case of 89 educational authorities in this country, and at some centres there was no arrangement for treating diseased ears. In quite a number the light for examination was inadequate, and at some the practice was simply to syringe out the ear to ascertain if anything came away. The best clinics were those attached to hospitals or where the work was done by those holding hospital appointments.—Mr. J. S. **FRASER** advocated the cessation of all school procedure for a time to permit of hearing tests being carried out; the gross testing could easily be done by the teachers, the ears being separately tested, and the child's face turned away to prevent lip-reading.—Sir **JAMES DUNDAS-GRANT** did not think the tests should be too delicate, but there was need for much general attention to this question among the children.—Mr. **DOUGLAS GUTHRIE** referred to the difficulty often experienced in getting the family doctor to do anything when the defect had been pointed out to him. It would be very interesting to know what happened later to these cases, and therefore a system of following them up would yield useful information.

Various Communications.

Dr. A. **BROWN KELLY** read a paper on Tortuosity of the Internal Carotid in Relation to the Pharynx. He showed that it nearly always occurred in the lateral part of the posterior wall, and it might be either unilateral or bilateral. It might occur in young growing people, therefore was not always due to age, as had been supposed.

Dr. W. S. **SYME** spoke on Displacement of the Antro-nasal Wall in the Treatment of Atrophic Rhinitis, emphasising the need of doing all that was possible to obviate distressing ozæna. He described the operation and spoke of very satisfactory results, especially in regard to ozæna.

Mr. **IRWIN MOORE** gave a communication on Chondromata and Chondro-osteomata of the Larynx, based upon a study of 20 cases recorded and described in the literature, and indicated what he considered to be the best means to treat this condition.

Sir **STCLAIR THOMSON** read a paper on Ecchondrosis of the Larynx, recording two cases of the condition which he had treated by laryngo-fissure.

Mr. A. L. **YATES** submitted a description of the methods he had adopted for determining the activity of the ciliated epithelium in certain cases of sinusitis. He pointed out that when there was stasis of the fluid mucus in the nose it was due to paralysis of the epithelium, ciliæ being paralysed by the toxins of the organisms present.—Sir **STCLAIR THOMSON** characterised this as a most valuable piece of work, and referred to his own inquiry into the subject many years ago.

Prof. **MAGNUS** gave an address on the

Experimental Basis for Theories on Vestibular Function.

He said it was necessary to make a sharp distinction between the function of the canals and the function of the auditory apparatus, ascribing to the canals all reactions to rotations, and to the otolitic apparatus all reactions depending on certain positions and the sensations of rectilinear movements. He submitted the following schedule:—

Labyrinthine Reflexes.—1. Reflexes corresponding to movements: Rotatory reactions: (*a*) on head; (*b*) on eyes; (*c*) on limbs; (*d*) on trunk. 2. Reflexes resulting from positions: (*a*) on limbs; (*b*) on neck (and trunk). Labyrinthine righting reflexes: (*a*) Asymmetrical; (*b*) symmetrical. Compensatory eye positions: (*a*) Vertical; (*b*) rotatory.

Discussing the possibility of ascertaining which reflexes were of the canals and which of the otolithic apparatus, he said that if the guinea-pig were centrifugalised at high speed the otolithic membranes could be placed completely out of action, the canal remaining normally responsive. The experiments showed that the epithelium of the macula, without any action of or connexion with otolithic membranes, was able to produce in its own metabolism excitations, hence it must be assumed that the function of the otolithic membrane was to increase or decrease the amount of excitation produced in the metabolism of the cells. In the mucous mass of the otolithic membrane were embedded crystals of calcium carbonate, and the total weight of these crystals in a single otolith membrane was about one-fiftieth of a milligramme. Further careful experimentation showed that the utricles and the otoliths were connected with these reflexes, and that the maximal effect of the otolithic apparatus was not, as formerly supposed, produced by shifting, but by pressing or pulling on the epithelium. Concerning rotatory eye positions, it had not been possible to make out with certainty from which part of the labyrinth those reflexes arose, but experiments were still being continued in Utrecht to settle the point. For the vertical eye position, however, the results were very clear. With both labyrinths intact, in rabbit and guinea-pig, there was no vertical eye deviation; but if one labyrinth were restricted the well-known vertical eye deviation occurred, and this eye deviation was found to depend on changes of the head position in space. In the lateral position it was at zero, or certainly minimal. He proceeded to show that the findings were in accordance with the minute anatomy of the parts, and asked for evidence from practising otologists on the clinical side.

Dr. **DE KLEIJN** followed with a demonstration on the epidiascope of the compensatory eye positions in patients. He pointed out the importance of excluding the tonic reflexes of the eye muscles, which arose when the position of the head in relation to the trunk was changed; therefore the position of the head in relation to the trunk must remain fixed. Similarly, reflexes due to movements must be excluded.

Mr. A. R. **TWEEDIE** discussed the subject of vertigo in relation to otolith and neck reflexes.

Sir **WILLIAM MILLIGAN** read a paper on

Malignant Disease of the Naso-Pharynx,

which was illustrated by lantern slides. He spoke of the value of a preliminary irradiation of the growth, as it caused a marked shrinkage and lessened the risk of disconcerting hæmorrhage. He favoured the insertion of small glass tubes charged with radium emanations. Radium he had found of great value for growths in regard to which ordinary surgery was contra-indicated. He objected to the splitting of the palate, preferring to gain efficient access by doing lateral rhinotomy. Surgery offered less hope for these cases than did radium.—Mr. **SYDNEY SCOTT** deplored the fact that these cases were seen too late because physicians too often treated the symptoms instead of investigating the possible causes.

Dr. **DAN MCKENZIE**, in an exhaustive treatment of the subject of

Diathermy for Pharyngeal Cancer,

said no remedy hitherto available could equal diathermy in the treatment of cancer of the throat; no other was applicable to both eradicable and ineradicable cancer. It had a cauterising and coagulating effect on the diseased tissues, and also an antiseptic effect by which tissues surrounding the growth were sterilised of bacteria. He described the procedure he followed in cases of varying degrees in both categories.

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He explained that his interest was originally aroused in this subject by the numerous examples of opaque specks and streaks seen in the routine work of the post-mortem room. Some of these streaks were shown to be minute adenomata, others small cysts with intracystic papillary growths; one was a minute true lipoma, and there were many other types. Small deposits of calcium salts and fats were not uncommon, and there occurred not infrequently the deposition of the cholesterin ester named myelin by Virchow. In these cases there were collections of large clear cells in the interstitial part of the kidney cortex. In paraffin sections these cells have a small pyknotic nucleus and faint outlines of a supporting framework can be seen, for which reason they have been termed "foamy" cells. When cut fresh and stained with Sudan III., these cells are stained a brownish pink colour, due to the presence of an anisotropic lipoid as shown by crossed Nicol prisms. In his opinion these cells were similar to those seen in the cutaneous xanthomata. The so-called myelin kidneys occurred in those patients who had a mixed parenchymatous and interstitial nephritis. Either there had been a primary parenchymatous condition followed by a chronic interstitial nephritis, or a glomerular nephritis had been succeeded by the other changes. They were also occasionally found in connexion with chronic endocarditis. The possible prognostic significance of myelin casts in the urine had been emphasised by Dr. McNee following Monck's work in 1913. In this connexion it was to be remembered that cholesteræmia might be present. He pointed out that experimentally myelin kidneys had been produced by feeding rabbits on cholesterin.

Dr. J. W. **McNEE** said that all degrees of this condition existed, from the slight speckling to the gross deposits in the cortex. The term was used to denote a special form of degeneration, which he had found to occur not only in nephritis but in the early stages of arterio-sclerosis, and in some surgical conditions—e.g., chronic mastitis. He believed that the change starts in the tubules, and that some of the fat is excreted as lipoid casts in the urine, and the rest goes via the lymphatics to the interstitial part of the kidney cortex. He believed that this peculiar type of degeneration represented a stage from which there was no recovery, whereas cells undergoing ordinary fatty degeneration were quite capable of regeneration. He therefore regarded myelin casts in the urine of definite prognostic importance, in that the case was one in which a progressive lesion was present, and the outlook was grave.

Dr. S. C. **DYKE** showed photographs of myelin kidneys through crossed Nicols; in his cases the myelin change was in the cells of the tubules. In all his cases there had been œdema and albuminuria, high cholesterol ester content in the blood, and a low urea concentration. In his opinion there was a close association between œdema and the myelin kidney.

Discussion on Polycystic Kidneys.

Sir **THOMAS HORDER** in opening this discussion based his remarks upon three personal cases.

CASE 1.—A man aged 43, when first seen had vomiting and diarrhœa, having had a similar attack over a year before. There was giddiness, with headaches, pains in the back, thirst, and polyuria. Some tingling sensations in the hands and legs were present, and just before being seen he had had a transient swelling of the face and legs each morning. Abdominal examination revealed two large renal swellings. For the first three days there was some pyrexia, the urine was diminished in quantity with some albuminuria. The urine output soon returned to within normal limits,

CASE 3.—A man aged 53, had had persistent vomiting for two years, and was first seen with anorexia, headaches, and urinous smelling breath. The urine was of low specific gravity, was not diminished in amount, and had a low urea concentration. The vomitus contained urea. His retinæ were unchanged, and the abdominal examination revealed bilateral renal swellings of typical character. Vomiting continued and patient died shortly after admission from uræmia with convulsions.

Sir Thomas Horder considered that these cases did nothing more than confirm the generally accepted views on the behaviour of the polycystic kidney. Patients usually came for advice when between 30 and 50, either for chronic renal disease, whether uræmic or cardio-vascular, or because of abdominal swellings. Their course was slow and subject to intercurrent renal nephritis. Unilateral cases would often live for a long time, and his difficulty was to define whether, in those cases of an unilateral swelling, the opposite kidney was unaffected or already cystic, for it was well recognised that one kidney might enlarge several years after the first. He concluded that surgery was not indicated unless the other kidney was normal or unless there were such severe pressure symptoms as to demand relief. He had come across no instances of this being a familial disease, nor had he seen any associated congenital deformities such as hare-lip, talipes equino-varus, &c.

Sir **BERNARD SPILSBURY** gave a complete account of three recent cases brought to post mortem at St. Bartholomew's Hospital.

CASE 1, under the care of Sir Percival Hartley, a man aged 52—had had chronic renal disease for many years, for which he had been invalided from the army. Two weeks before death he was seized with an attack of giddiness which passed into unconsciousness. On admission he had a left hemiplegia, frequency of micturition, and headache. Post-mortem examination showed a small hæmorrhage in the right internal capsule with advanced atheroma of the arteries at the base of the brain, and a cystic condition of both kidneys and of the liver. The liver weighed 50 oz., and scattered through it were a large number of small cysts. Otherwise the organ appeared normal. The kidneys were typical. Microscopically, the liver cysts were lined by a cubical epithelium, and there was pressure atrophy of the liver tissue around the cysts, suggesting that the cysts were actively enlarging. In addition there was a considerable quantity of proliferating bile-ducts through the liver and under its capsule. The kidney cysts were lined with cubical and at times columnar epithelium, and contained hyaline material, necrotic cells, and débris. Dense fibrous tissue riddled the kidney tissue in which there was evidence of marked hypertrophy. In a few of the cysts papillomatous growths were seen. The arteries of these kidneys showed arterio-sclerosis.

CASE 2, under the care of Mr. McAdam Eccles, was a man aged 47. In 1914 this patient was operated on for a suspected pyonephrosis. During the last few months the pain had recurred and there was progressive weakness. The urine contained blood and pus. A large tumour was present, and the case died with signs of uræmia. Post-mortem examination showed atheroma of the aorta; liver enlarged to 72 oz. and containing many cysts; both kidneys enlarged and cystic, and pyelitis in the left; and left suprarenal hypertrophied. Microscopically, liver and kidneys similar to Case 1, save that no proliferating bile-ducts were seen in this liver. Pus and *B. coli* were found in some of the kidney cysts.

CASE 3.—This was Sir Thomas Horder's third case described above. Po[illegible]rtem showed aortic atheroma, liver enlarged with [illegible] eys very much enlarged, and both suprarenals h[illegible]. Microscopically, the liver contained proliferat[illegible]ts, and the kidneys showed [illegible]e amyloid char[illegible]e this case corresponded liver cysts were also due to an excess development of bile-ducts, some of which did not join up with the liver tissue. These livers showed no signs of inflammation or cirrhosis.

The PRESIDENT opened the discussion by commenting on the absence of any mention of hæmaturia as a symptom. He quoted two cases in which this had been present, one being of particular interest because a smart hæmaturia occurred at the age of 30, after which the patient had been passed as a first-class life for insurance. He had seen no associated congenital defects in any of his cases.

Dr. GRAHAM FORBES said that this question was of great interest to him as it had formed the subject of his M.D. thesis very many years ago. During the 25 or more years that had elapsed, he had found nothing of any interest to add to what he had then written. Dr. Forbes read extracts of some of the salient features of the cases he had collected at that time.

Mr. SWIFT JOLY described a case of a man with hæmaturia and a swelling in the right renal region. Cystoscopy showed the blood coming from the right ureter. The diagnosis made was malignant growth of the right kidney, which was exposed. It turned out to be a polycystic kidney and the wound was closed. Three years later that man had another hæmaturia, and cystoscopy revealed blood coming from the left ureter, and that kidney was enlarged. With regard to the familial incidence, one patient had consulted him with bilateral polycystic kidneys, saying that he was one of five brothers, all of whom had congenital cystic kidney. He did not believe that there were any indications for nephrectomy. Surgery did no good but harm. He was anxious to hear if any surgeon had tried pyelography in these cases. He had found that the shadow of the pelvis, though normal in appearance with no flattening of the calyces, yet had a very long calyx system. One of his cases the length was quite four times the normal. He suggested that this affords an early diagnostic criterion.

Mr. GIRLING BALL recalled a case of a child who died of polycystic kidney following an operation for genu valgum; also another child who died during measles from the polycystic kidney. He had recently in Berne watched de Quervain operate on one of these cases, by cutting a slice—like a slice of a lemon—out of the kidney. He claimed that fibrosis followed, and improvement in the patient. Mr. Ball was somewhat sceptical concerning the value of this operation.

Mr. C. A. R. NITCH said that he had always thought the infantile and the adult type of case were of different ætiology, and he asked Sir Bernard Spilsbury how he reconciled the one view for the two classes of case.

Sir THOMAS HORDER and Sir BERNARD SPILSBURY replied to the discussion, both commenting on the value of Mr. Joly's suggestion of pyelography in diagnosis, and in reply to Mr. Nitch pointing out that the same process was involved, the change being only a matter of degree.

PARIS: VACATION COURSE IN DISEASES OF CHILDREN.—A vacation course in diseases of children will be given at the Hôpital des Enfants Malades, 149, Rue de Sèvres, Paris, from July 24th to August 14th, under the direction of Prof. Nobecourt and Dr. Lereboullet. There will be two meetings each day, at 10.30 A.M. and 4 P.M., and Prof. Nobecourt will give clinical instruction every morning at 9.15. The fee for the course is Fr.150. A detailed programme may be obtained from the Faculté de Médecine, University of Paris.

A course of 13 sessions on the treatment of tuberculosis of the bones, joints, and ganglia, together with methods of practical orthopædics, will be given at the Hôpital Maritime, Berck-plage, from July 15th to 30th. The course will be conducted by Dr. E. Sorrel, surgeon to the hospitals of Paris and chief surgeon to the Marine Hospital of Berck, assisted by Drs. Moyer and Parin, of the Maritime Hospital Laboratory, Dr. Lance, of the Sick Children's Hospital, and others. The meetings will be held in the afternoons at 2 o'clock. The fee for the course is Fr.150. Full particulars may be obtained from Dr. Sorrel, 46, Rue du Général Foy, Paris.

Reviews and Notices of Books.

EPIDEMIC ENCEPHALITIS.

Encephalitis Lethargica. By ARTHUR J. HALL, M.A., M.D. Camb., F.R.C.P. Lond., Professor of Medicine, University of Sheffield. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd.; Bristol: John Wright and Sons, Ltd. 1924. Pp. 229. 12*s*.

THE greater part of this work formed the Lumleian Lectures delivered before the Royal College of Physicians of London in 1923 and published in abridged form in THE LANCET of April 14th, 1923. The additions made in the present volume comprise details which could not be included within the limits of the lectures, references to more recent studies and experiences since their delivery, and a section on treatment.

It was on April 20th, 1918, that Prof. Hall and Dr. Wilfred Harris independently announced in the same number of THE LANCET that within the previous fortnight a series of cases of illness presenting remarkable features had appeared in this country. Prof. Hall, although he characteristically omits to do so, can therefore claim the merit of being one of the first to detect the "new disease"; his careful notes and records of the early cases of encephalitis contributed in no small degree to the clinical presentation of the outbreak of 1918. Since then his published writings have added to our knowledge of the malady whose epidemic prevalence this year in Great Britain on an unprecedented scale makes the appearance of this book all the more timely. For the purpose of the lectures Prof. Hall has read widely. The lengthy bibliography, in main that of the Ministry of Health's Report on Encephalitis Lethargica, published in 1922, but extended and brought up to the present time by the author, numbers no less than 2056 references. It becomes almost the task of a life-time to keep well abreast of the literature of epidemic encephalitis. Indeed, it is here that we would make the most serious criticism of Prof. Hall's book. If anything, he has been too generous towards the experience and views of others and too restricted in the expression of his own. To take an example at random, in alluding to the hæmorrhagic syndrome, the writings of physicians in England, France, and America are referred to in some detail; but Prof. Hall's personal knowledge of the subject is not allowed to appear. We would also express the hope that in future editions the author will give us more instruction from his case-books; the few cases he quotes only serve to whet the reader's appetite. In Chapter IV. Prof. Hall tells us that he has been so impressed by the protean manifestations of the disease that he finds it impossible to recognise any regular distinction beyond the broader divisions of acute and chronic. Accordingly he gives no set description of the malady, but an account of the clinical manifestations that may be encountered. It is true that these are the forms which most frequently come to the attention of the consulting neurologist, yet the characteristics of epidemic encephalitis as a general infectious disease must not be ignored. The prodromal period and the onset of pyrexia too often escape recognition as part and parcel of the one disease, even although nervous localising signs appear subsequently. Further, the general features of epidemic encephalitis are in harmony with the description of the allied disease, epidemic poliomyelitis. A brief but useful account of the later manifestations of epidemic encephalitis is given. As regard treatment, the author's melancholy verdict is that "at present any reliable therapeusis, either for the disease itself or for its many after-results, does not exist."

The work constitutes a comprehensive treatise on epidemic encephalitis which neither neurologist nor general physician can afford to exclude from his book-shelf. It is well illustrated by a number of plates, with intracystic papillary growths; one was a minute true lipoma, and there were many other types. Small deposits of calcium salts and fats were not uncommon, and there occurred not infrequently the deposition of the cholesterin ester named myelin by Virchow. In these cases there were collections of large clear cells in the interstitial part of the kidney cortex. In paraffin sections these cells have a small pyknotic nucleus and faint outlines of a supporting framework can be seen, for which reason they have been termed "foamy" cells. When cut fresh and stained with Sudan III., these cells are stained a brownish pink colour, due to the presence of an anisotropic lipoid as shown by crossed Nicol prisms. In his opinion these cells were similar to those seen in the cutaneous xanthomata. The so-called myelin kidneys occurred in those patients who had a mixed parenchymatous and interstitial nephritis. Either there had been a primary parenchymatous condition followed by a chronic interstitial nephritis, or a glomerular nephritis had been succeeded by the other changes. They were also occasionally found in connexion with chronic endocarditis. The possible prognostic significance of myelin casts in the urine had been emphasised by Dr. McNee following Monck's work in 1913. In this connexion it was to be remembered that cholesteræmia might be present. He pointed out that experimentally myelin kidneys had been produced by feeding rabbits on cholesterin.

Dr. J. W. McNee said that all degrees of this condition existed, from the slight speckling to the gross deposits in the cortex. The term was used to denote a special form of degeneration, which he had found to occur not only in nephritis but in the early stages of arterio-sclerosis, and in some surgical conditions—e.g., chronic mastitis. He believed that the change starts in the tubules, and that some of the fat is excreted as lipoid casts in the urine, and the rest goes via the lymphatics to the interstitial part of the kidney cortex. He believed that this peculiar type of degeneration represented a stage from which there was no recovery, whereas cells undergoing ordinary fatty degeneration were quite capable of regeneration. He therefore regarded myelin casts in the urine of definite prognostic importance, in that the case was one in which a progressive lesion was present, and the outlook was grave.

Dr. S. C. Dyke showed photographs of myelin kidneys through crossed Nicols; in his cases the myelin change was in the cells of the tubules. In all his cases there had been œdema and albuminuria, high cholesterol ester content in the blood, and a low urea concentration. In his opinion there was a close association between œdema and the myelin kidney.

Discussion on Polycystic Kidneys.

Sir Thomas Horder in opening this discussion based his remarks upon three personal cases.

Case 1.—A man aged 43, when first seen had vomiting and diarrhœa, having had a similar attack over a year before. There was giddiness, with headaches, pains in the back, thirst, and polyuria. Some tingling sensations in the hands and legs were present, and just before being seen he had had a transient swelling of the face and legs each morning. Abdominal examination revealed two large renal swellings. For the first three days there was some pyrexia, the urine was diminished in quantity with some albuminuria. The urine output soon returned to within normal limits, the albumin disappeared, but the blood-urea remained high. Urea concentration in the urine was on four occasions 1 per cent., 1·1 per cent., 1·1 per cent., and 1·15 per cent. Diagnosis was bilateral polycystic kidney, and the man is alive to-day, some two years after.

Case 2.—A woman aged 34, came for advice because of a large abdominal tumour two months after her second normal pregnancy. The gynæcologist who saw her believed the tumour to be coming from the pelvis, and thought it an ovarian cyst. Laparotomy revealed a left polycystic kidney, which was removed. The right kidney was slightly enlarged to the examining hand, and the pelvic organs normal. Afterwards she developed an acute coli infection of the urine, which subsided afterwards. Patient alive and well two and a half years later.

Case 3.—A man aged 53, had had persistent vomiting for two years, and was first seen with anorexia, headaches, and urinous smelling breath. The urine was of low specific gravity, was not diminished in amount, and had a low urea concentration. The vomitus contained urea. His retinæ were unchanged, and the abdominal examination revealed bilateral renal swellings of typical character. Vomiting continued and patient died shortly after admission from uræmia with convulsions.

Sir Thomas Horder considered that these cases did nothing more than confirm the generally accepted views on the behaviour of the polycystic kidney. Patients usually came for advice when between 30 and 50, either for chronic renal disease, whether uræmic or cardio-vascular, or because of abdominal swellings. Their course was slow and subject to intercurrent renal nephritis. Unilateral cases would often live for a long time, and his difficulty was to define whether, in those cases of an unilateral swelling, the opposite kidney was unaffected or already cystic, for it was well recognised that one kidney might enlarge several years after the first. He concluded that surgery was not indicated unless the other kidney was normal or unless there were such severe pressure symptoms as to demand relief. He had come across no instances of this being a familial disease, nor had he seen any associated congenital deformities such as hare-lip, talipes equino-varus, &c.

Sir Bernard Spilsbury gave a complete account of three recent cases brought to post mortem at St. Bartholomew's Hospital.

Case 1, under the care of Sir Percival Hartley, a man aged 52—had had chronic renal disease for many years, for which he had been invalided from the army. Two weeks before death he was seized with an attack of giddiness which passed into unconsciousness. On admission he had a left hemiplegia, frequency of micturition, and headache. Post-mortem examination showed a small hæmorrhage in the right internal capsule with advanced atheroma of the arteries at the base of the brain, and a cystic condition of both kidneys and of the liver. The liver weighed 50 oz., and scattered through it were a large number of small cysts. Otherwise the organ appeared normal. The kidneys were typical. Microscopically, the liver cysts were lined by a cubical epithelium, and there was pressure atrophy of the liver tissue around the cysts, suggesting that the cysts were actively enlarging. In addition there was a considerable quantity of proliferating bile-ducts through the liver and under its capsule. The kidney cysts were lined with cubical and at times columnar epithelium, and contained hyaline material, necrotic cells, and débris. Dense fibrous tissue riddled the kidney tissue in which there was evidence of marked hypertrophy. In a few of the cysts papillomatous growths were seen. The arteries of these kidneys showed arterio-sclerosis.

Case 2, under the care of Mr. McAdam Eccles, was a man aged 47. In 1914 this patient was operated on for a suspected pyonephrosis. During the last few months the pain had recurred and there was progressive weakness. The urine contained blood and pus. A large tumour was present, and the case died with signs of uræmia. Post-mortem examination showed atheroma of the aorta; liver enlarged to 72 oz. and containing many cysts; both kidneys enlarged and cystic, and pyelitis in the left; and left suprarenal hypertrophied. Microscopically, liver and kidneys similar to Case 1, save that no proliferating bile-ducts were seen in this liver. Pus and *B. coli* were found in some of the kidney cysts.

Case 3.—This was Sir Thomas Horder's third case described above. Post-mortem showed aortic atheroma, liver enlarged with cysts, kidneys very much enlarged, and both suprarenals hypertrophied. Microscopically, the liver contained proliferating bile-ducts, and the kidneys showed some amyloid change, otherwise this case corresponded closely to the others.

Sir Bernard Spilsbury summed up these cases as showing very similar kidney conditions with arterio-sclerosis, signs of chronic interstitial nephritis, hypertrophy of the heart, and aortic atheroma, and two of them suprarenal hypertrophy. The age at which these patients died was the same period at which occurred deaths from chronic interstitial nephritis. He had no doubt at all that the origin of the polycystic kidney was in some anomaly of development. He regarded the renal inadequacy as due to superimposed nephritis and not due to pressure of the cysts in the renal tissue. He believed that the liver cysts were also due to an excess development of bile-ducts, some of which did not join up with the liver tissue. These livers showed no signs of inflammation or cirrhosis.

The PRESIDENT opened the discussion by commenting on the absence of any mention of hæmaturia as a symptom. He quoted two cases in which this had been present, one being of particular interest because a smart hæmaturia occurred at the age of 30, after which the patient had been passed as a first-class life for insurance. He had seen no associated congenital defects in any of his cases.

Dr. GRAHAM FORBES said that this question was of great interest to him as it had formed the subject of his M.D. thesis very many years ago. During the 25 or more years that had elapsed, he had found nothing of any interest to add to what he had then written. Dr. Forbes read extracts of some of the salient features of the cases he had collected at that time.

Mr. SWIFT JOLY described a case of a man with hæmaturia and a swelling in the right renal region. Cystoscopy showed the blood coming from the right ureter. The diagnosis made was malignant growth of the right kidney, which was exposed. It turned out to be a polycystic kidney and the wound was closed. Three years later that man had another hæmaturia, and cystoscopy revealed blood coming from the left ureter, and that kidney was enlarged. With regard to the familial incidence, one patient had consulted him with bilateral polycystic kidneys, saying that he was one of five brothers, all of whom had congenital cystic kidney. He did not believe that there were any indications for nephrectomy. Surgery did no good but harm. He was anxious to hear if any surgeon had tried pyelography in these cases. He had found that the shadow of the pelvis, though normal in appearance with no flattening of the calyces, yet had a very long calyx system. One of his cases the length was quite four times the normal. He suggested that this affords an early diagnostic criterion.

Mr. GIRLING BALL recalled a case of a child who died of polycystic kidney following an operation for genu valgum; also another child who died during measles from the polycystic kidney. He had recently in Berne watched de Quervain operate on one of these cases, by cutting a slice—like a slice of a lemon—out of the kidney. He claimed that fibrosis followed, and improvement in the patient. Mr. Ball was somewhat sceptical concerning the value of this operation.

Mr. C. A. R. NITCH said that he had always thought the infantile and the adult type of case were of different ætiology, and he asked Sir Bernard Spilsbury how he reconciled the one view for the two classes of case.

Sir THOMAS HORDER and Sir BERNARD SPILSBURY replied to the discussion, both commenting on the value of Mr. Joly's suggestion of pyelography in diagnosis, and in reply to Mr. Nitch pointing out that the same process was involved, the change being only a matter of degree.

PARIS: VACATION COURSE IN DISEASES OF CHILDREN.—A vacation course in diseases of children will be given at the Hôpital des Enfants Malades, 149, Rue de Sèvres, Paris, from July 24th to August 14th, under the direction of Prof. Nobecourt and Dr. Lereboullet. There will be two meetings each day, at 10.30 A.M. and 4 P.M., and Prof. Nobecourt will give clinical instruction every morning at 9.15. The fee for the course is Fr.150. A detailed programme may be obtained from the Faculté de Médecine, University of Paris.

A course of 13 sessions on the treatment of tuberculosis of the bones, joints, and ganglia, together with methods of practical orthopædics, will be given at the Hôpital Maritime, Berck-plage, from July 15th to 30th. The course will be conducted by Dr. E. Sorrel, surgeon to the hospitals of Paris and chief surgeon to the Marine Hospital of Berck, assisted by Drs. Moyer and Parin, of the Maritime Hospital Laboratory, Dr. Lance, of the Sick Children's Hospital, and others. The meetings will be held in the afternoons at 2 o'clock. The fee for the course is Fr.150. Full particulars may be obtained from Dr. Sorrel, 46, Rue du Général Foy, Paris.

Reviews and Notices of Books.

EPIDEMIC ENCEPHALITIS.

Encephalitis Lethargica. By ARTHUR J. HALL, M.A., M.D. Camb., F.R.C.P. Lond., Professor of Medicine, University of Sheffield. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd.; Bristol: John Wright and Sons, Ltd. 1924. Pp. 229. 12*s*.

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The work constitutes a comprehensive treatise on epidemic encephalitis which neither neurologist nor general physician can afford to exclude from his book-shelf. It is well illustrated by a number of plates,

Laboratory Diagnosis of Syphilis.

A Manual for Students and Physicians. By Hideyo Noguchi, M.D., Ph.D., D.Sc., Member of the Rockefeller Institute for Medical Research, New York. London: Humphrey Milford. 1923. Pp. 392. 36s.

The author considers that the laboratory procedures for the diagnosis of syphilis falls into two groups: (a) the detection of the causative spirochæte, (b) the detection of certain pathological changes produced in the tissues by the micro-organism. In the first group he believes that the dark-ground illumination is the most reliable method of demonstrating the spirochæte of syphilis, and most workers on this subject will agree with him. The chapter on microscopical technique gives many hints and much useful information with regard to dark-ground apparatus and its manipulation. We would point out that no indication is given that a high dry lens (3 mm.) with a correction collar gives as good, if not better, results than an oil-immersion lens, and, in addition, is easier to handle. The various staining methods, negative and positive, are fully dealt with, including many very recent procedures. The excellent photographs in this section of the book should prove very helpful in enabling laboratory workers to gain a thorough idea of the morphology of the various spirochætes likely to be encountered in material suspected of containing the *Treponema pallidum*.

The greater part of the volume is concerned with the sero-diagnosis of syphilis (Wassermann test). The introductory chapters give a satisfactory account of the theory of the fixation of the complement test. The main idea of the remainder of this section is to show the advantages of the author's method, using an acetone-insoluble antigen and an anti-human hæmolytic system. It cannot be said, however, that considering the tested accuracy of the Wassermann as done by modern standardised technique the author has brought much evidence to support his contention. The relative value of Wassermann methods is not a matter of opinion but of actual results, and the author's arguments without comparative tests are not sufficient to convince that his method is more reliable than the ordinary test. In fact, many sound objections could be urged against his method both from the technical and theoretical side; for instance, against the use of 2 units of amboceptor, of an acetone-insoluble antigen, and especially the failure to titrate complement in the presence of antigen before each test. As in many American books, the account of British literature is incomplete; for instance, there is no mention of any of the valuable series of reports published by the Medical Research Council on the Wassermann test and its reliability.

Le Problème de l'Anaphylaxie.

By Auguste Lumière. Paris: Gaston Doin. 1924. Pp. 241. Fr.30.

This book deals with the problem of anaphylaxis from the latest physico-chemical point of view of the colloid. The introductory chapter reviews the subject historically in clear narrative fashion, but the bulk of the book is devoted to the modern physical conception of anaphylaxis. The author starts from the well-known Tyndall experiment on colloids and leads up to the work of Dold who has applied the principles of Tyndall in the seroscope. From this point onwards he shows step by step how the anaphylactic phenomena result from the alteration in the colloidal state of the serum of the sensitised animal brought into contact with the antigen, and he rejects, in consequence, the theory of a chemical toxic factor, believed in by the older experimenters. This alteration in the colloidal state of the serum—to use the author's own words, " la formation d'un floculat dans le sérum "—is, in the author's opinion, responsible for the anaphylactic shock by acting on nerve terminations of the endothelium of the vessels supplying the nerve centres. By this means sudden excitation of these centres produces in turn vaso-dilatation of the visceral blood-vessels and a fall of arterial pressure. Various blood changes then follow apparently as a result of alteration of osmotic pressure.

This, in brief, is the author's theory of anaphylaxis. The separate stages are worked out with logical precision, and a certain number of experiments illustrated with beautifully coloured drawings are given, but the author is led along the paths of theory faster than the facts warrant. Although the colloidal theory of anaphylaxis has much more to be said in its favour than any other, yet there are many difficulties still to be faced which the author does not even mention. There are large and important questions summed up in the terms indirect and secondary anaphylaxis yet to be answered, whilst clinical medicine bristles with points of interest to the serologist still awaiting solution. And whether or no these questions can be answered by the colloidal theory we do not yet know. The author barely mentions the large stock of material accumulated by Chandler Walker and others on protein sensitisation. In our opinion, it is on this particular question that the final test of the theories of anaphylaxis must be made. Hitherto animal experiments have by no means followed the lines of clinical experiments in protein sensitisation as applied to skin tests of asthma and gastro-intestinal disturbances, and there would appear to be still some additional factors in the problem unrecognised. As an exposition of the colloidal theory of anaphylaxis, however, this book is a useful guide, concisely and logically thought out.

Posture.

Körperstellung. By R. Magnus, Professor at the Reichsuniversität, Utrecht. Berlin: J. Springer. 1924. Pp. 740. $6.45.

This work contains in a fairly complete, and therefore somewhat bulky, form an account of the researches of Prof. Magnus and his pupils and colleagues which have earned world-wide fame. After dealing with the subject-matter in its general aspects, the conditions which determine particular reflexes and the maintenance of posture are considered. The chapters on compensatory posture of the eyes, and on the relations of the labyrinth, neck, and eyes to postural tonus, contain a description of some of the finest work in neurology during the present century; the clinical applications of this series of investigations must obviously be very extensive, and some interesting examples are given by way of illustration. The book concludes with a chapter on the influence of various poisons on posture. Taken as a whole, the degree of precision attained is remarkable. This knowledge has been obtained by a variety of methods—by graphic methods, direct observation, surgical experiments on the labyrinths and on the central nervous system, and by large numbers of photographs and cinematograph films. The inclusion among the 263 illustrations of a number of stereoscopic photographic reproductions adds greatly to the value of the publication.

The Science and Art of Anæsthesia.

By Col. W. Webster, M.D. London: Henry Kimpton; St. Louis: C. V. Mosby Co. Illustrated. 1924. Pp. 214 24s.

This book is designed to help " the medical student and the physician in general practice." It is a pleasing manual in size, shape, and excellence of printing. Unfortunately it lacks many of those details which are essential in the instruction of those for whom it is intended. They are nowhere told just what to do in the process of procuring and maintaining anæsthesia. In the physiology of the drugs which he is to use and in some general principles the reader is well instructed, and help is given in these pages as to treatment before and after operation. The author states that he has purposely omitted " plates " showing different positions of patients for different operations, and no one would blame him for that in a work of this size, but he has no fewer than nine pages of illustrations of apparatus for nitrous oxide, and this prodigality appears disproportionate. Few things are less instructive than pictures or diagrams of apparatus. The student can only learn to use apparatus by handling it, and this lesson must be enforced in a small manual. Some of these pages might well be replaced by brief instructions in the treatment of common difficulties and dangers arising during anæsthesia, a subject which the author has almost ignored.

Internal Secretions.

Biology of the Internal Secretions. By Francis X. Dercum, M.D., Ph.D., Professor of Nervous and Mental Diseases in the Jefferson Medical College, Philadelphia. London and Philadelphia: W. B. Saunders Company, Ltd. 1924. Pp. 241. 14s.

In giving us this account, chiefly clinical, of the internal secretions, and especially of their relations to malformations and mental diseases, the author has attempted much. The time is really not yet ripe for such sweeping applications of endocrinology, as events will no doubt prove. But if we keep the limitations constantly in mind the book should provide us with stimulating, if at times rather bewildering, reading, though its value would have been considerably increased if precise references to the authors quoted had been given. By those eager to investigate the possibilities of the clinical application of endocrinology, and their number is rapidly increasing, these pages will be read with interest.

Sexualité et Hormones. By Ch. Champy, Docteur en Médecine, Docteur ès Sciences, Professeur Agrégé à la Faculté de Médecine de Paris. Paris: Octave Doin. 1924. Pp. 372. Fr.30.

In this interesting volume much of the discussion turns on the facts of secondary sexual characters and of the conditions which bring about their modification. The author considers the influence of hormones on sexual differentiation, with especial reference to the effect of the thyroid, which has been well investigated, and of the hormones arising in the gonads themselves. The localisation of the sex hormones exclusively in any one tissue, such as the interstitial tissue of the gonads, is considered to be without justification. The volume is well illustrated, contains the results of a large amount of original work, and displays much careful thought.

Atlas of Diseases of the Chest.

Thoraxschnitte von Erkrankungen Der Brustorgane. By Dr. Walter Koch, Professor of Pathological Anatomy, Berlin. Berlin: Julius Springer. 1924. Pp. 403. $10.75.

While it is generally acknowledged that the physician's art should be built up on a basis of morbid anatomy, it is not so well realised how difficult it is for the majority of medical students to obtain a practical first-hand knowledge of topographical morbid anatomy. They may have demonstrated to them diseased organs which have been removed from the body, but unless time is of no object and classes are small, it is scarcely possible for them to study completely and at leisure the organs while still in the body. The same routine cannot well be adopted in the study of morbid anatomy as obtains in the dissecting room, and in consequence it is really difficult for the student to appreciate the meaning and importance of the lesions he is taught to recognise in the isolated organ. Only the individual who actually removes the viscera from the thorax in, for example, a case of pulmonary tuberculosis can fully understand the significance of the physical signs which may have been elicited during life. The teacher of morbid anatomy who recognises the limitations imposed on him by the exigencies of the medical curriculum will welcome Dr. Koch's excellent atlas. In it some 30 examples of the more chronic pulmonary diseases—pleurisy, phthisis, valvular lesions of the heart, aneurysm of the aorta, new growths, and so forth—are described and illustrated by full-page photographs of vertical sections of the thorax at different antero-posterior levels. Each figure is accompanied by an outline "key," and each case is rendered complete by the inclusion of clinical and post-mortem protocols, and a general summary or discussion. There are also admirable X ray photographs of several of the cases, which are clear and beautifully reproduced, and fulfil their purpose excellently. The Atlas should be a real help to the student in enabling him to understand more truly the actual physical condition of his patients.

Chemical Encyclopædia.

By C. T. Kingzett. London: Baillière, Tindall and Cox. 1924. Pp. 606. 30s.

To compile an ideal chemical encyclopædia would be an impossible task. The present volume is suitable for schools, junior students, and general readers as a book of reference. To the laboratory worker it is of little value, since too little information is given. The contents are remarkably complete with regard to the number of substances referred to, but there is not enough descriptive matter. A better title would have been A Chemical Dictionary.

Biochemistry.

The Vegetable Proteins. Second edition. By Thomas B. Osborn, Ph.D. London: Longmans, Green and Co. 1924. Pp. 154. 9s.

The first edition of Dr. Osborn's book was regarded as one of the standard works upon the subject of vegetable proteins. The advances in this particular branch of biochemistry have been greater perhaps than in any other part, and many of these advances have originated from Dr. Osborn's own laboratory. The importance of the chemical constitution of vegetable proteins in relation to animal feeding has long been recognised, and it is mainly to the researchers in agricultural chemistry that we owe the recent increase in our knowledge. The monograph commences with an historical summary of the subject, and then proceeds to a detailed account of the classification, occurrence, composition, and chemical and physiological properties of the vegetable proteins, while two useful chapters are included on the nutritive value and on the physiological relations of the vegetable proteins to animal organisms. A full account of anaphylaxis in connexion with these bodies is given. An important chapter on the relation of the proteins to acids and bases has been provided by Prof. L. J. Henderson. The volume will prove of great use to all working on this particular branch of biochemistry.

Analyses de chimie biologique. By Rene Clogne. Paris: Le François. 1924. Pp. 281. Fr.14.

The French manuals on practical biochemistry usually strike those accustomed to reading many books of a similar character as being very much out of date. The methods described are too often slight modifications of those in use 30 or 40 years ago, and it is seldom that the newest methods are included. This volume forms a pleasant exception, since it contains workable descriptions of such methods as those of Folin and Wu, Marriot and P. A. Shaffer. What is more, it is obvious that these methods have not been simply copied from other text-books, for the printer's errors in connexion with Folin's methods are not repeated with that dismal regularity with which they unfortunately appear in many of the English manuals. The working descriptions of all the methods described are clear, accurate, and concise, and the scope of the book is sufficiently wide to cover all the needs of students or a routine laboratory. The author is to be congratulated upon his work.

LABORATORY DIAGNOSIS OF SYPHILIS.

A Manual for Students and Physicians. By HIDEYO NOGUCHI, M.D., Ph.D., D.Sc., Member of the Rockefeller Institute for Medical Research, New York. London: Humphrey Milford. 1923. Pp. 392. 36*s*.

THE author considers that the laboratory procedures for the diagnosis of syphilis falls into two groups: (*a*) the detection of the causative spirochæte, (*b*) the detection of certain pathological changes produced in the tissues by the micro-organism. In the first group he believes that the dark-ground illumination is the most reliable method of demonstrating the spirochæte of syphilis, and most workers on this subject will agree with him. The chapter on microscopical technique gives many hints and much useful information with regard to dark-ground apparatus and its manipulation. We would point out that no indication is given that a high dry lens (3 mm.) with a correction collar gives as good, if not better, results than an oil-immersion lens, and, in addition, is easier to handle. The various staining methods, negative and positive, are fully dealt with, including many very recent procedures. The excellent photographs in this section of the book should prove very helpful in enabling laboratory workers to gain a thorough idea of the morphology of the various spirochætes likely to be encountered in material suspected of containing the *Treponema pallidum*.

The greater part of the volume is concerned with the sero-diagnosis of syphilis (Wassermann test). The introductory chapters give a satisfactory account of the theory of the fixation of the complement test. The main idea of the remainder of this section is to show the advantages of the author's method, using an acetone-insoluble antigen and an anti-human hæmolytic system. It cannot be said, however, that considering the tested accuracy of the Wassermann as done by modern standardised technique the author has brought much evidence to support his contention. The relative value of Wassermann methods is not a matter of opinion but of actual results, and the author's arguments without comparative tests are not sufficient to convince that his method is more reliable than the ordinary test. In fact, many sound objections could be urged against his method both from the technical and theoretical side; for instance, against the use of 2 units of amboceptor, of an acetone-insoluble antigen, and especially the failure to titrate complement in the presence of antigen before each test. As in many American books, the account of British literature is incomplete; for instance, there is no mention of any of the valuable series of reports published by the Medical Research Council on the Wassermann test and its reliability.

LE PROBLÈME DE L'ANAPHYLAXIE.

By AUGUSTE LUMIÈRE. Paris: Gaston Doin. 1924. Pp. 241. Fr.30.

THIS book deals with the problem of anaphylaxis from the latest physico-chemical point of view of the colloid. The introductory chapter reviews the subject historically in clear narrative fashion, but the bulk of the book is devoted to the modern physical conception of anaphylaxis. The author starts from the well-known Tyndall experiment on colloids and leads up to the work of Dold who has applied the principles of Tyndall in the seroscope. From this point onwards he shows step by step how the anaphylactic phenomena result from the alteration in the colloidal state of the serum of the sensitised animal brought into contact with the antigen, and he rejects, in consequence, the theory of a chemical toxic factor, believed in by the older experimenters. This alteration in the colloidal state of the serum—to use the author's own words, "la formation d'un floculat dans le sérum"—is, in the author's opinion, responsible for the anaphylactic shock by acting on nerve terminations of the endothelium of the vessels supplying the nerve centres. By this means sudden excitation of these centres produces in turn vaso-dilatation of the visceral blood-vessels and a fall of arterial pressure. Various blood changes then follow apparently as a result of alteration of osmotic pressure.

This, in brief, is the author's theory of anaphylaxis. The separate stages are worked out with logical precision, and a certain number of experiments illustrated with beautifully coloured drawings are given, but the author is led along the paths of theory faster than the facts warrant. Although the colloidal theory of anaphylaxis has much more to be said in its favour than any other, yet there are many difficulties still to be faced which the author does not even mention. There are large and important questions summed up in the terms indirect and secondary anaphylaxis yet to be answered, whilst clinical medicine bristles with points of interest to the serologist still awaiting solution. And whether or no these questions can be answered by the colloidal theory we do not yet know. The author barely mentions the large stock of material accumulated by Chandler Walker and others on protein sensitisation. In our opinion, it is on this particular question that the final test of the theories of anaphylaxis must be made. Hitherto animal experiments have by no means followed the lines of clinical experiments in protein sensitisation as applied to skin tests of asthma and gastro-intestinal disturbances, and there would appear to be still some additional factors in the problem unrecognised. As an exposition of the colloidal theory of anaphylaxis, however, this book is a useful guide, concisely and logically thought out.

POSTURE.

Körperstellung. By R. MAGNUS, Professor at the Reichsuniversität, Utrecht. Berlin: J. Springer. 1924. Pp. 740. $6.45.

THIS work contains in a fairly complete, and therefore somewhat bulky, form an account of the researches of Prof. Magnus and his pupils and colleagues which have earned world-wide fame. After dealing with the subject-matter in its general aspects, the conditions which determine particular reflexes and the maintenance of posture are considered. The chapters on compensatory posture of the eyes, and on the relations of the labyrinth, neck, and eyes to postural tonus, contain a description of some of the finest work in neurology during the present century; the clinical applications of this series of investigations must obviously be very extensive, and some interesting examples are given by way of illustration. The book concludes with a chapter on the influence of various poisons on posture. Taken as a whole, the degree of precision attained is remarkable. This knowledge has been obtained by a variety of methods—by graphic methods, direct observation, surgical experiments on the labyrinths and on the central nervous system, and by large numbers of photographs and cinematograph films. The inclusion among the 263 illustrations of a number of stereoscopic photographic reproductions adds greatly to the value of the publication.

THE SCIENCE AND ART OF ANÆSTHESIA.

By Col. W. WEBSTER, M.D. London: Henry Kimpton; St. Louis: C. V. Mosby Co. Illustrated. 1924. Pp. 214 24*s*.

THIS book is designed to help "the medical student and the physician in general practice." It is a pleasing manual in size, shape, and excellence of printing. Unfortunately it lacks many of those details which are essential in the instruction of those for whom it is intended. They are nowhere told just what to do in the process of procuring and maintaining anæsthesia. In the physiology of the drugs which he is to use and in some general principles the reader is well instructed, and help is given in these pages as to treatment before and after operation. The author states that he has purposely omitted "plates"

THE LANCET.

LONDON: SATURDAY, JULY 5, 1924.

MUNICIPAL AND HOME DISINFECTION.

WE publish this week an interesting article by Dr. DUNCAN FORBES, medical officer of health for Brighton, who deals from personal experience with the comparative merits of municipal and home disinfection in scarlet fever and diphtheria. In this paper there is well illustrated the change of opinion which has been going on for 30 years or more in respect of the factors which make for the spread of infection in these two diseases, and Dr. FORBES suggests that much of the elaborate and extravagant procedure which characterised the 'eighties and 'nineties and the first few years of this century was open to the charge of being ill-directed, serving little purpose except to give a fancied security to the householder. The message of the paper, indeed, is that the household, with certain well-directed assistance from the municipality, can obtain usually the same measure of security by personal efforts as by relying upon central assistance, and it need hardly be said that the more the population can help themselves in sanitary matters the better will public health be served.

Until 1909 the usual ritual was followed at Brighton of removing all persons suffering from scarlet fever or diphtheria to the isolation hospital, when thorough disinfection of the home premises was carried out. The process was extended not only to the patient's and the mother's clothing, to mattresses and to bedclothes, but to the contents of wardrobes and chests, while curtains and carpets were removed for steam disinfection and the walls, ceiling, and floor of the room lately occupied by the patient were sprayed with disinfectant. But while this drastic course was still being pursued the opinion was getting stronger that epidemic prevalence was due to personal contact with the case; it was felt that scattered organisms in the premises had no substantial consequence compared to that dependent on the massive doses of organisms to be derived from the patient and from handkerchiefs and towels contaminated by immediate discharges from the carriers. Consequently, in 1909, the steam disinfection of the bedding and mattresses was stopped at Brighton, and instructions were given to householders for the immediate and proper cleansing of linen and cotton goods which had been in contact with the sick subject and for the disinfection by boiling water of all feeding and drinking utensils, toys, books, and other articles which had been in the patient's immediate environment. Eleven years later procedure was further simplified when the spraying of the sick-room was given up, cleansing and the accompanying disinfection being left to the householder. Dr. FORBES's paper contains a short series of figures—too short, as he admits, to constitute absolute proof of any contention—showing that at Brighton disinfection by the local authority has presented no advantage over disinfection by the housewife.

Dr. FORBES's conclusions have been submitted by us to the medical officers of health of certain large and representative cities with the result that we find the main contentions to be substantially endorsed, with certain individual reservations due to differences of locality. But if disinfection of houses in cases of scarlet fever and diphtheria is found to be unnecessary, some of the contracts entered into by big municipalities may be an extravagance, and this is a matter which needs consideration, if only to prevent the hasty conclusion that vast and unwarranted expenditure is taking place. The Corporation of London puts down in its form for tender a probable annual requirement of 5000 gallons of disinfectant fluid of high coefficiency as well as 20 named disinfectants in fluid or powder form. Clearly no substantial proportion of these commodities is required for spraying infected chambers. It is not possible to compare accurately the bulk and cost of the disinfectants and chemicals used in various health departments because no two health departments cover quite the same ground, nor do they use the same solutions, nor apparently do they spend money in this way in any amount proportionate to the population. One progressive city, for example, with a population of nearly 1,000,000, used or gave out disinfectants from its public health department to the value of £163 for the financial year ending March 31st, 1924, a figure which shows that here no extravagance was committed. The disinfectants are used for a vast number of purposes, and non-employment in spraying premises where scarlet fever or diphtheria patients have resided would lead to little annual diminution in expense to the ratepayers. And the moral value of using disinfectants, probably not so needed in a city like Brighton as in cities where there is a great slum population to deal with, must not be left out of count.

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A MEETING of representatives of associations of disabled men of Austria, France, Germany, Great Britain, Italy, and Poland met at Geneva in 1921 and appealed to the International Labour Office to help to further the production of appliances for the benefit of the mutilated and to spread a knowledge of them. The office, which is connected with, but not a part of, the League of Nations, accordingly asked Dr. FLORENT MARTIN to compile a report which should set forth what has been done in all countries to provide prostheses and other appliances for the disabled with a view to helping not only sufferers in the late war, but also those whose injuries were received in civil life. Dr. MARTIN was well known during the war as the director of the artificial limb factory at La Panne, in Belgium, where, under his direction, was made an artificial leg, the merits of which he strongly advocated. He is now director of the Technical and Scientific Institute of Artificial Limb-Fitting at Brussels, which was set up there in 1921 by the Permanent Inter-allied Committee for Disabled Men. The director of the International Labour Office, Mr. ALBERT THOMAS, who writes a prefatory note to the report, truly says that the International Labour Office would fail in its mission if it did not assert its direct value to those in many spheres who, in the words of the Peace Treaty, suffer from "injustice, hardship, and privation."

Dr. MARTIN's task was not a light one. To survey such a large field and to summarise the work done in Europe and America, giving due importance to each type of apparatus, without exaggeration of the merits of some or depreciation of the merits of others, is not easy; nor would it be difficult to find fault with some of the statements to which Dr. MARTIN has committed himself as to the usual practice in

Protoplasmic Action and Nervous Action.

By Ralph S. Lillie. Chicago, Illinois: University of Chicago Press. 1923. Pp. 417.

The volume is based on a series of lectures delivered to biologists. The author starts by complaining that far too much attention is being paid to analytical methods for studying organisms, whilst synthetic investigations on these lines are entirely neglected. Mr. Lillie claims that the problems involved in the transition between inanimate and animate systems are no more difficult than others which have yielded to scientific investigation; and that carefully planned investigations should go a long way towards solving the difficulties. Those who are under the influence of philosophies such as that of Herbert Spencer will have little sympathy for the author's views, and will be inclined to skip the 400 odd closely printed pages. This would be unfair, since, although one may hold the view that attempts to synthesise protoplasm are a waste of time, the actual experiments upon living tissues are worthy of consideration. Thus the chapters dealing with protoplasmic response to surface tension and chemical composition of the media are very good indeed. The concluding chapter contains a useful series of comparisons between conduction in nerve and various chemical reactions. Although the objects of the book are rather vague, the experimental details form interesting reading.

Masonry.

The Men's House. By J. Fort Newton. Pp. 261. *Symbolical Masonry.* By H. L. Haywood. Pp. 380. *The Great Teachings of Masonry.* By H. L. Haywood. Pp. 187. London: George Allen and Unwin, Ltd. 1924. 8s. 6d. each.

These three volumes, as their titles indicate, are written for Masons, whether they have only just become members of the craft or are well advanced in the higher degrees. But they are also of interest to the uninitiate, who will learn much about the aims of Masonry, and to a certain extent about the meaning of the Ritual. Dr. Newton's book consists of a series of papers upon various aspects of Masonry, including one on Rudyard Kipling, the Living Laureate of the Craft.

Of Mr. Haywood's two books "Symbolical Masonry" will be found most generally interesting, for symbolism and ritual appeal to every nation and class of men. The chapter on That Which Was Lost, deals with the Tetragrammaton—i.e., the ineffable Name of God. Shakespeare asked, "What's in a name?" but among primitive peoples there was a great deal in a name, for if anybody knew another's name he acquired some power over him. For instance, among primitive peoples it was almost a crime to address a fellow tribesman by his name, and instead of saying, "Old Cow, will you lend me a spear?" the would-be borrower, if he followed correct procedure, said, "Third cousin by the mother's side thrice removed, will you lend me a spear?" Among the ancient Hebrews the Name of God was regarded with such reverence that it was only allowed to be pronounced by one person on one day in the year—namely, by the High Priest on the Day of Atonement. And after the Temple was destroyed nobody ever said it at all. They *wrote* the tetragrammaton YHVH, but they *said* Adonai—i.e., the Lord—and no one knows to this day what the proper vowels for the tetragrammaton are. So the lost Name became a source of much mystical legend and teaching. Mr. Haywood's other volume deals with the teachings of Masonry and its aims and objects, and is good complement to the volume on Symbolism.

Messrs. Baillière, Tindall and Cox are the English agents for the "Annals of Medical History" of which Vol. VI., No. 1 was reviewed last week in this column. The annual subscription is £2 2s. per annum and the price of single copies is 12s. 6d.

EPSOM COLLEGE:

THE ANNUAL GENERAL MEETING.

At a well-attended annual general meeting of the Governors of Epsom College, held at 49, Bedford-square, W.C., on June 27th, Dr. Raymond Crawfurd in the chair, the annual report for the previous year recorded a good total of progress. Many certificates and distinctions were obtained, while of 31 boys who presented themselves for the War Office "Certificate A" 26 were successful. From the financial point of view the income and expenditure account for the year 1923 showed a substantial surplus of receipts over payments, this gratifying result being mainly due to the receipt of £4500 from the surviving trustees of the will of the Rev. J. W. W. Taylor, to a gift of £1000 by Mr. William Tinker, "to be administered as the Council think best," and to a further donation of £1000 from Lord Rosebery, earmarked for the addition to the College chapel. The rebuilding of the nave of the chapel in harmony with the new chancel was the object of the War Memorial Fund, and this fund remains open, while special efforts are being made by the Old Epsomian Club to collect the balance still required for the completion of the nave. Cheques towards the fund, drawn in favour of the Epsom College War Memorial Fund, should be sent to Mr. S. Maynard Smith, 49, Wimpole-street, W. 1; an announcement was made in the report that the supporters of the War Memorial Fund will be given the same voting privileges as those enjoyed by contributors to the Royal Medical Foundation of the College. The health of the boys was very good during the year reported upon.

In the forefront of the report was placed a record of the services of Sir Henry Morris, who has resigned the position of treasurer, being succeeded in this office by Mr. Herbert S. Pendlebury. After the secretary of the College had read Sir Henry Morris's formal resignation, the following resolution was moved from the chair and carried unanimously:—

> The Governors of Epsom College desire to record upon their minutes the deep regret with which they accept the resignation of the treasurership of the College by Sir Henry Morris, Bart., who for 18 years has carried out the onerous duties of that office with untiring zeal and energy. Only those who have been closely associated with him on the Council can realise the extent of the time and labour which he has devoted so disinterestedly to the service of the College, not only as treasurer, but also as chairman of the Works Committee, which additional office he has held for almost as long a period. In assuring Sir Henry Morris of their gratitude for all that he has done for the College, the Governors wish to endorse the expression of deep obligation which the Council has already conveyed to him, and they trust that he will live for many years to watch the continued progress of the College, and of the Royal Medical Foundation attached to it, in both of which he has been so keenly interested.

Beneficiaries under the Foundation.

The scrutineers, Dr. E. Climson Greenwood, Dr. Seymour Taylor, and Dr. Harold Spitta, then reported the successful candidates to be as under:—

For Pensionerships.

	Votes.		Votes.
*Banks, Henry	2154	*O'Connor, Jessie E. M.	1969
*Hayne, Mary A. . ..	2073	*Hind, Minna M. A. R.	1860
*Sinclair, Augustine W.	1997	†Pike, Louisa	1700
*Pinniger, Emma . ..	1986	‡Buncombe, Harriet M.	1675

* Ordinary pensioners.

† "Pugh" pensioner. ‡ "Sir Thomas Smith" pensioner.

For Annuities.

	Votes.		Votes.
§Yate, Catherine	4790	‖Brittain, Anne	2267

§ "Morgan" Annuitant. ‖ "Brodie Sewell" Annuitant.

For Foundation Scholarships.

	Votes.		Votes.
Gray, David H. . ..	13,040	Biggs, Derek R.	9868
Shepperd, Guy . ..	12,560	Taylor, Robert B. ..	9381
Trotter, C. Robert F..	11,298		

THE LANCET.

LONDON: SATURDAY, JULY 5, 1924.

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Dr. Forbes's conclusions have been submitted by us to the medical officers of health of certain large and representative cities with the result that we find the main contentions to be substantially endorsed, with certain individual reservations due to differences of locality. But if disinfection of houses in cases of scarlet fever and diphtheria is found to be unnecessary, some of the contracts entered into by big municipalities may be an extravagance, and this is a matter which needs consideration, if only to prevent the hasty conclusion that vast and unwarranted expenditure is taking place. The Corporation of London puts down in its form for tender a probable annual requirement of 5000 gallons of disinfectant fluid of high coefficiency as well as 20 named disinfectants in fluid or powder form. Clearly no substantial proportion of these commodities is required for spraying infected chambers. It is not possible to compare accurately the bulk and cost of the disinfectants and chemicals used in various health departments because no two health departments cover quite the same ground, nor do they use the same solutions, nor apparently do they spend money in this way in any amount proportionate to the population. One progressive city, for example, with a population of nearly 1,000,000, used or gave out disinfectants from its public health department to the value of £163 for the financial year ending March 31st, 1924, a figure which shows that here no extravagance was committed. The disinfectants are used for a vast number of purposes, and non-employment in spraying premises where scarlet fever or diphtheria patients have resided would lead to little annual diminution in expense to the ratepayers. And the moral value of using disinfectants, probably not so needed in a city like Brighton as in cities where there is a great slum population to deal with, must not be left out of count.

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Dr. Martin's task was not a light one. To survey such a large field and to summarise the work done in Europe and America, giving due importance to each type of apparatus, without exaggeration of the merits of some or depreciation of the merits of others, is not easy; nor would it be difficult to find fault with some of the statements to which Dr. Martin has committed himself as to the usual practice in this country in prosthetic matters before the war and since 1914. He divides types of artificial limbs into two classes, American and European, but his descriptions of the European types are in many cases inapplicable to the limbs made in Great Britain. He is therefore not a very trustworthy guide here, and the British reader is more likely to profit by his survey of continental practice. The opinions expressed as to sites of amputations and the general principles of limb-fitting are sound, but we think that Dr. Martin is unduly pessimistic as regards certain end-bearing stumps. The light metal limb, which has become so popular in Britain, appears to be little known on the Continent, and its advantages and disadvantages not to be understood. The later results of cinematisation of stumps would appear to have been disappointing in France, Italy, and Belgium, as they have been here, where it may safely be said that the practice has been given up altogether. Information is lacking as to the true position of this procedure in Germany, where Sauerbruch continues to vaunt its success, but where most other surgeons are significantly silent on the subject. Neither is Krukenberg's procedure of splitting a forearm stump in order to form " tongs " recommended by Dr. Martin, whose references to German methods of limb-fitting are not copious. With his views on artificial hands we are in general agreement, though he is inclined to magnify their practical value. Appliances—the simpler the better—have proved of much greater practical worth than hands, though these have greater æsthetic value. His remarks about the problems arising from loss of both hands are suggestive, but he appears to be unacquainted with the ingenious table invented by Mr. George Thomson, of Edinburgh, which our Ministry of Pensions has supplied to handless men, and he reproduces 30 illustrations from a brochure by the English limb-maker, F. G. Ernst, on the equipment of such an amputee without mention of the author's name. This is not an isolated instance; although various American and other limb-makers are mentioned by name, none of the most successful British makers are named, although their work may be referred to.

We have nothing but praise for the public spirit and energy of the International Labour Office as shown in the production of this report, as well as in many other ways. It is to be feared, however, that interesting as it may be to surgeons and limb-makers, the British amputee will not gain much by a study of it.

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THE RELIEF OF ASTHENOPIA.

Binocular single vision depends upon the muscles of the two eyes being so coördinated that their combined action always maintains the parallelism of the two eyes. Its maintenance depends upon the reflex muscular response to the stimulation of light in the maculæ of the two eyes. When this stimulus is removed by the occlusion of one eye, the parallelism is still maintained, at any rate approximately, but in most cases only approximately. There is, as a rule, slight divergence, but there may be slight convergence or a slight vertical deviation from parallelism. The importance of slight lateral deviation is generally considered to be negligible so far as the necessity of treatment goes, but the occurrence of vertical deviation is found to be a not very uncommon cause of asthenopia which may call for treatment by appropriate prisms. This is the generally received view. Prof. F. W. Marlow,[1] in an essay recently published, goes far beyond this. He finds that by occluding one eye for a long period—say, a week—an amount of latent deviation, both lateral and vertical, is disclosed far in excess of what the ordinary Maddox rod test without any preliminary occlusion reveals. As is well known, latent errors of refraction can in many cases only be made evident after the paralysis of the ciliary muscle by means of atropine. Similarly, if we had a drug capable of paralysing the external muscles of the eye we might in that way discover the position of rest. As we have not, it is necessary to use the method of occlusion which attains the same object. According to Dr. A. Duane, such prolonged occlusion tends to make the eyes revert to their infantile state in which, not being controlled by coördinative influence, they exhibit a varying imbalance. Prof. Marlow disagrees and cites cases in which a week's occlusion has produced an exaggeration of the pre-existing heterophoria which does *not* vary. This position of rest, he says, affords relief to the strain on the extra-ocular muscles just as the correction of a refractive error may afford relief to an over-strained ciliary muscle, and according to him the prescription of appropriate prisms determined by the post-occlusion tests may relieve cases of asthenopia in which there may be no refractive error at all and in which the ordinary tests for heterophoria give negative results. The cases to which this method is applicable must necessarily be rare. The author, however, claims to have treated successfully cases of obscure asthenopia in which refraction and the muscle balance without occlusion were both normal, or in which the refractive error had already been corrected. The treatment advocated is the constant wearing of prisms where this is possible, and when not, operative treatment which, again, resolves itself into " partial tenotomy," an operation hitherto much more in vogue in America than in England.

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THE SCOTTISH BOARD OF HEALTH.

The fifth annual report of the Scottish Board of Health has just reached us. In a brief introduction it is noted that the general death-rate per 1000 of population reached the record figure of 12·9, and that the infantile mortality has dropped to 78·9 compared with 101·4 in 1922, a retrogressive year, and 90·3 in 1921. Even the present figure can hardly be regarded as satisfactory, though it shows considerable progress. The infantile mortality rates for England and Wales for the years 1922 and 1923 are 77 and 69·2 respectively. While climatic conditions are, on the whole, more favourable in England for rearing infants, it is acknowledged that the climate of every country generates its own methods of protection, and that special precautions in severer climates may, to a certain extent, counteract atmospheric conditions. In Norway and Sweden, for example, the infantile mortality is low. To the school health service is allotted more space than in former reports of the Board. Since out of 208,706 children examined during the school year, 100,980, or 48·3 per cent., were found to be suffering from physical defects, all must share the hope expressed in the report that the development of this service, curtailed by economic conditions, may soon be extended to its full capacity. The last section of the report includes a survey of the effects of unemployment on the physical welfare of the population, on the technical skill of trained and partly-trained workers, and on morale, which deserves careful study. The conclusion is reached that, thanks mainly to comprehensive relief measures, the period of serious unemployment which has now extended over three years, is not likely to leave a serious mark on the physique of the Scottish people. But there can be little doubt that young people growing up in a world that makes no call on their capacities for service are likely to suffer mentally and morally from such unstimulating conditions, and it is obvious that a revival of trade will result in the more energetic coöperation of young people in schemes designed for the improvement of the public health.

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[1] The Relative Position of Rest of the Eyes and the Prolonged Occlusion Test. By F. W. Marlow, M.D., Professor of Ophthalmology in the College of Medicine, Syracuse University. Philadelphia: F. A. Davis Company. 1924. Pp. 96.

Annotations.

"Ne quid nimis."

THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE annual report on the Museum of the Royal College of Surgeons by the Conservator, Sir Arthur Keith, opens with an appreciative account of the work done for the Museum by Prof. S. G. Shattock from his appointment as pathological curator in 1897, until his death on May 11th, 1924. Mr. Cecil F. Beadles, assistant curator, records donations made to the pathological series of specimens during the year, drawing special attention to a series of livers showing carcinoma associated with bilharzial cirrhosis, received from the South African Institute for Medical Research, Johannesburg (Dr. W. Watkins-Pitchford); shells of the fresh-water snails which form the intermediary host of *Schistosoma* in South Africa, from Mr. H. Temple Mursell, and of the Asiatic variety of the parasite in Japan from Dr. J. B. Christopherson; "radium carcinoma" of the thumb, removed from a man who had handled radium for many years, from Mr. C. P. G. Wakeley; and actinomycotic caries of foot in an ancient Egyptian, from Prof. D. Derry. The descriptive catalogue of the Army Medical Collection, which is in the custody of the Council of the College, makes good progress; the whole of Group A (gunshot injuries) has now been finally arranged and numbered. The Teratological Collection has been removed to a larger gallery and has received 14 additions during the year. The Collection of Surgical Instruments, to which Mr. Alban Doran continues to give devoted service, has been enriched by a set of thoracic callipers, goniometers, and three-plane stethometers described by the late Dr. Arthur Ransome in 1876; by the kymograph (or polygraph) used by Sir James Mackenzie before 1902; and by a number of ophthalmic instruments associated with the name of Sir John Tweedy and bequeathed by him to the College. In the physiological department, among other excellent work, Mr. Richard H. Burne, the curator, has supervised the histological examinations required by Sir Charles Ballance for experiments on the anastomoses of various nerves. Some early results of these experiments are recorded on p. 21 of this issue of THE LANCET. The Odontological Collection, of which Sir Frank Colyer is honorary director, and the Onodi Collection, under the supervision of Mr. T. B. Leyton, are being further extended. Research work is being actively pursued in all departments of the Museum and the usual courses of demonstrations were given by Sir Arthur Keith in association with the late Prof. S. G. Shattock in October, 1923, and with Mr. C. E. Shattock in March and April of this year. There remains for comment the report of the conservator on the department of human osteology, which is his own special province, and should also be a source of legitimate pride. The new catalogue being prepared by Miss M. L. Tildesley, appointed research assistant for this purpose in 1920, is only now approaching completion, since the work has been much more complicated than was estimated. It is to be hoped that it will be possible to retain Miss Tildesley's services until the work is accomplished. During the past year—through the generosity of the town council of Scarborough—an important addition was made to this collection. In the course of certain excavations the graves of men, women, and children, representatives of the population of the East Riding between the eleventh and sixteenth centuries, had to be disturbed and the remains of 130 individuals were handed over to the Royal College of Surgeons for preservation and study. Sir Arthur Keith answers the question often put to him by casual visitors to the Museum—What is the use of making such an assemblage of human skulls and skeletons? The main object is the study of man—the anatomy of his body in present and past times. His skeleton is the only permanent part of his body—it is by the study of skeletal remains, often of a fragmentary nature, that the anatomist or anthropologist has to unravel the history of man's body and trace the evolution of its various parts and identify racial migrations. The only means of telling how far man's body can withstand the conditions set up by modern civilisation is by the comparison of the same people at different epochs. This can be done only by a study of skeletal remains. The department of human osteology in the Museum is not a thing of recent creation; its foundation was laid by Hunter. The foresight of a long line of conservators—of whom not the least zealous is the present holder of that office—has made it the standard collection of its kind for the British Empire.

THE TREATMENT OF INFECTED TEETH.

IT is common knowledge that a considerable number of pulpless teeth, including many that have received dental treatment, may show areas of rarefaction of bone around the ends of the roots as revealed by radiographic examination, the lesions constituting one of the forms of dental sepsis. The modern tendency is to regard these infected areas as representing a more potentially dangerous form of focal infection than the more open lesions of pyorrhœa. The view has often been expressed that all such teeth should be removed, especially when there is reason to suspect that they may be related to some general disturbance of health. This is counsel which would put an end to a large field of conservative dentistry. These teeth are usually free from local symptoms; they are often firmly implanted and are serviceable aids to mastication. The usual method of treatment by mechanically removing infected debris from the root canals and introducing various antiseptics has the disadvantage that the chief infection is outside the tooth in the bone around the apex. Since the root canal progressively narrows towards the apex, the possibility of an antiseptic acting on the peri-apical tissues seems slight. Over two years ago H. C. Moxham [1] suggested a method of treating infected teeth by introducing an emulsion of *Bacillus bulgaricus* into the canals. He showed by laboratory experiments on freshly extracted teeth that if the canals were rendered sterile and then inoculated with streptococci or staphylococci, these organisms were killed in 24 hours by *B. bulgaricus* introduced into the canals. He followed up this work by treating infected teeth in the mouth in the same way. The root canals were mechanically cleansed and milk cultures of *B. bulgaricus* placed in the canals and sealed in for periods varying from one day to three weeks. The canals were then opened under aseptic precautions. A decided smell of lactic acid was noticed in some cases. A bacteriological test was made and it was found in most cases that living *B. bulgaricus* was the only organism present in the canals, the others having been killed. Of 25 teeth with fistulæ present 22 responded to the treatment, as shown by the rapid healing of the sinus, and no discomfort was suffered by the patient. The only way of determining whether this method of treatment can affect the diseased areas outside the tooth is by radiographic examination at intervals to ascertain whether the rarefied areas show signs of diminishing and becoming denser; a test not free from fallacies. The results, according to Moxham, are encouraging, though not conclusive. This work did not attract much attention, but recently F. C. Wilkinson [2] has published a paper describing his results, using the same technique as Moxham. He finds with the latter that the clinical results are good and that the *B. bulgaricus* effectively replaces the other organisms present in infected canals. The radiographic results are less encouraging. In one case the films appeared to show definite

evidence of osseous regeneration; in some others there was slight evidence of improvement, while the rest were doubtful or negative. The number of teeth treated was only eight; this is explained by the difficulty of obtaining bacteriological coöperation. The radiographic test is certainly not very satisfactory, for to compare films of the same tooth taken at intervals and to interpret any differences as valid evidence of anatomical change is to leave out of account various factors concerned with radiographic technique which may easily vitiate the results. A better method which might be possible in a few cases would be to select teeth showing apical rarefaction and to treat them with cultures of *B. bulgaricus* and then to trephine the bone and examine the peri-apical tissues bacteriologically, but it might not be easy to find patients willing to submit to the test even in the cause of science. The results of both Moxham and Wilkinson are sufficiently hopeful to deserve further investigation. The careful coöperation required between dentist, radiologist, and bacteriologist makes it essentially a study to be carried out in a dental hospital. The pulpless tooth forms one of the most important problems in modern dentistry to-day, and any method which might promise a solution compatible with the retention of these teeth in a healthy condition is worth investigating on an extensive scale.

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[1] Dental Science Journal of Australia, March, 1922.

[2] British Dental Journal, April 1st, 1924.

MIDWIVES AND JURY SERVICE.

The Home Secretary, having been approached by the Ministry of Health with regard to the liability of women working as midwives to serve on juries, has sent a circular letter on the subject to the under-sheriffs. It is pointed out that the question of legislation to secure general exemption for all midwives in virtue of their calling will be considered when a suitable opportunity presents itself. The circular contains sympathetic reference to the undoubted need of midwives for special consideration in view of the necessary urgency of calls upon them for their attendance at confinements. Further, the Home Secretary expresses the view that in practice midwives are excused from service when their aid is urgently required, and suggests that upon under-sheriffs being satisfied that a certified midwife has given notice to a local supervising authority of her intention to practise as such, a mark should be placed against her name in the jury book so as to prevent a summons being sent to her. If the terms of this instruction or suggestion are complied with, it seems that midwives will have no further ground for complaint. By a schedule to the Juries Act, 1870, a large number of classes of persons are exempted from jury service, including peers, Members of Parliament, judges, clergymen, and ministers of religion as defined by the schedule, barristers, solicitors, and various other persons engaged in the practice of the law. All registered medical practitioners and pharmaceutical chemists are also exempt, as well as officers of the navy, army, and other services, civil and otherwise, including police officers and justices of the peace.

SPLANCHNIC ANÆSTHESIA.

In a visit to a continental surgical clinic nothing is more likely to strike an observer than the contrast of the methods of anæsthesia there adopted with those prevalent in our own operating theatres. On the Continent a reliance is commonly placed on methods of local and regional anæsthesia, whilst the skilled technique of general anæsthesia to which we are accustomed does not seem to have been developed. Yet the very skill of our own anæsthetists has largely blinded us to the undoubted advantages of local methods. As Crile pointed out, the protection of the subconscious centres is of vital importance and can only be effectively carried out by a local nerve-block. The method of splanchnic anæsthesia has been extensively used on the Continent, and the article which we publish this week, by Mr. Stanley Hillman, gives examples of its remarkable possibilities. The technique of the method is simple, though it requires accuracy of execution, and the resulting block is so complete that even the largest operations can be carried out without pain and with an absence of shock unapproached in other methods. The method consists in the injection of about 50 c.cm. of 1 per cent. novocaine into the region of the semilunar ganglia, a very fine needle being inserted on either side of the first lumbar vertebra for the purpose. A preliminary aspiration ensures that a vessel has not been entered. Not only can extensive operations on the stomach be then conducted without pain or shock, but this inhibition may persist for long after the operation is concluded and well into the period of convalescence. Brunn and Mandl in the *Wiener klinische Wochenschrift* of May 22nd, 1924, describe another remarkable use of this inhibition of the sympathetic nerves. Injecting at different levels in the dorsal region so as to block the rami communicantes of the sympathetic ganglia, they have succeeded in cutting out afferent impulses from various organs, such as the gall-bladder and kidney. They suggest the use of the method as a means of differential diagnosis between lesions of the different viscera, but they also consider that the injections may in certain circumstances have an actual curative effect. The cutting of the reflex which results relieves spasm of the musculature of the viscus, and the cases they describe suggest that under these circumstances a gall-stone may be passed or a kidney recover its inhibited function. The method appears to open up a new field and its development will be followed with interest.

MOSQUITO CONTROL AT HAYLING ISLAND.

A piece of interesting and useful health work about which too little is known has for several years been carried out at Hayling Island in Hants. It is concerned with the amelioration of the mosquito pest in the neighbourhood and owes its origin and much of its success to the enthusiasm and efforts of Mr. J. F. Marshall, F.E.S. He and the members of the executive committee of the Mosquito Control association have issued a third report which gives an account of the work accomplished from May, 1923, to May, 1924. It is a well-illustrated pamphlet of 12 pages which, after certain remarks on mosquitoes generally and the methods employed for their reduction, considers in some detail the objects of the Hayling Mosquito Control. This was organised in 1920 to cope with the intolerable mosquito nuisance so prevalent at a large number of summer resorts along the coast-line of Dorset, Hampshire, Sussex, and Kent. A laboratory was established at Hayling Island and investigations showed that the chief mosquito culprit was *Ochlerotatus detritus*, a salt-marsh breeder. Aided by *Ochlerotatus rusticus*, the larvæ of which are found in the stagnant fresh water of field and roadside ditches, and by *Theobaldia annulata*, whose larvæ have a liking for foul waters contaminated by sewage or other refuse, this mosquito does its best to make life miserable by its blood-sucking propensities. It has a greater range of flight than either of its two "non-salt" congeners, but the latter are often a cause of serious annoyance, and the Hayling Mosquito Control plead for the assistance of local sanitary authorities and of landowners not only against these insects, but with respect to *Culex pipiens*, the common "domestic" gnat which, though probably less blood-thirsty than the other species, yet merits attention. The intensive work of the Control against *Ochlerotatus detritus* is indicated by an excellent map of the "Salterns" area of Hayling Island, and it is gratifying to find how much has been accomplished in the way of abolishing mosquito nurseries. White Cross disinfectant in a strength of 1 part in 30,000 has been found useful as a larvicide, and water thus treated is harmless if drunk by human beings or animals. A good deal of drainage has been carried out, and it is noteworthy that the Control has received monetary support for its operations from the Ministry of Health

on the recommendation of Colonel S. P. James. The grant has been suitably bestowed for, despite considerable difficulties, marked improvements have been effected. Reference is made to the somewhat similar work carried out on behalf of the Navy by Surg.-Commander D. H. C. Given, R.N., in the Gosport and Alverstoke district, where formerly the residents were unable to sit out in their gardens of an evening owing to the attacks of mosquitoes. The use of larvivorous shrimps, which was a feature of the naval operations, is not mentioned. The report concludes with a list of the known British mosquitoes and a description of the four species with which the Hayling Mosquito Control is specially concerned. An informative museum has been established at Seacourt, South Hayling, the residence of Mr. Marshall, and is open to the public, while lectures and lantern demonstrations are given at stated times. This report records with commendable brevity and modesty work which merits recognition.

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IN a paper on the Dentist and the State, read by Mr. H. Cantor at the annual business meeting of the London Hospital Dental Society, interesting reference was made to the evidence of identity which may be obtained from the teeth of a deceased person. Cases will occur to all in which human remains have been found where the circumstances accompanying or following death have made impossible recognition by persons familiar with the appearance of the deceased when alive, or have rendered errors of identification easy. In cases of death by drowning, or where the body has lain for long exposed or long buried before discovery, the teeth may be the one distinctive and unchanged feature that survives. A murderer often makes an attempt to destroy deliberately all evidence of the identity of his victim, but even the use of fire for this purpose is apt to leave fragments which an expert can recognise who has had the mouth of the deceased under his care. Mr. Cantor gave as examples the identification of the mutilated remains of the Prince Imperial during the Zulu War through a gold filling, and of the remains of the Duchesse d'Alençon after the fire at the Bazar de la Charité in Paris, by a denture which fitted the plaster cast retained by her dentist. It is not necessary to labour the matter. The dentist clearly can supply evidence practically beyond contradiction as to the identity of human remains, if the jaws, or a reasonable portion of their dental equipment, have been preserved, if there is some clue as to the identity which needs authoritative confirmation or disproof, and if the dentist applied to has kept careful records. The limitations of this method of identification are obvious; a large class of persons do not have recourse to dentists, or at any rate do not have accurate records made of their dental conditions.

THE TREATMENT OF VENEREAL ADENITIS BY SOLAR RAYS.

THE salutary effects of the sun are commonplace knowledge in these days as they were in ancient times, when even the caves which served as dwelling places were chosen where they faced the south. Among the Romans exposure to sunlight was held to be not only a remedy but a valuable hygienic measure, and Hippocrates, Celsus, and Galen prescribed sun-baths in certain diseases. At the present day the practical application of this remedial agent has been vastly extended, and good results have been obtained in a large sphere of diseases, such as tuberculosis, leukæmia, Basedow's disease, epithelioma and dermato-syphilis. Dr. Gino Murero, of the dermato-syphilitic clinic at Bologna, publishes[1] five cases of suppurative inguinal adenitis from venereal ulcers, which tend to show that distinct beneficial effects can be obtained in intractable cases by exposure to solar rays. His technique is to choose the morning hours for the exposure, especially in the months of July and August, when the temperature is less high than during the rest of the day, thus avoiding disturbances and profuse sweating caused by excessive heat, and also because in the morning hours the atmosphere is clearer and does not absorb so many ultra-violet rays. The diseased part is exposed directly to the sun while the patient lies on a bench, the rest of the body being suitably protected by coloured curtains. The only application used was sterilised gauze. In all the five cases improvement took place almost at once after four or five sittings, but the healing process increased about the ninth or tenth exposure with the disappearance of the œdema and of the bluish-red tint of the edges, and with the elimination of the necrotic patches, which are usually seen at the base of the ulcer, and their replacement by healthy granulations and consequent transformation and diminution of sanious discharge. Cure was usually complete after 25 sittings. It is worth while drawing attention to these results, because such abscesses as sequelæ of ulcers, due to Ducrey's bacillus, by their resistance to ordinary methods of cure, are the cause of much physical suffering and expense to the patient. No special technique is needed, nor is any exclusive locality absolutely indispensable for the treatment; the patient can obtain the cure of his disease wherever there is possibility of exposing the affected parts of the body to the sun's rays. Medical observation and control, it need hardly be said, are absolutely necessary if uneventful cure is to be assured.

THE PREVENTION OF AEROPLANE CRASHES.

THE aviation display at Hendon last Saturday passed off without mishap. The mechanical efficiency of modern planes will be given the chief credit for this gratifying circumstance; but according to the figures set out in a well-reasoned contribution to the U.S. Naval Medical Bulletin for March, praise should be offered rather to the qualities of quick judgment and resolute decision possessed by the British and French aviators who took part. Under the title of "Aviation Accidents and Methods of Prevention" Lieutenant J. F. Neuberger, Medical Corps, U.S. Navy, who has been serving in the flagship of the Aircraft Squadrons Scouting Fleet, discusses the lessons to be learnt from the statistics collected. The causes of investigated crashes in the experience of the U.S. Navy in 1922 were physical and mental defect, 60 per cent.; insufficient knowledge and experience, 10 per cent.; mechanical (plane or motor), 24 per cent.; weather, 4 per cent.; unavoidable, 2 per cent. The chief cause of crashes is thus some mental defect, including error of judgment, in the aviator himself. It is pointed out that slowness of reaction time should be recognised during the medical examination of the candidate for the Air Force; the slow-reacting man might just as well be disqualified then, or when undergoing recruit training, as later. At this stage he will not have killed anyone or caused loss to the public by damaging expensive machinery. Most men learn to fly in eight hours; why trouble to accept those who cannot learn under 10? Medical officers of aviation units should be officers who themselves fly, are keen on flying, and understand the aviators' difficulties. A flight surgeon should be told off to go through the recruit's course with each batch under instruction, that he may know the individuals intimately, and be able to estimate their flying ability with full understanding. Medical observation should not cease when they are graded pilots, but should be continuous until they fly. The U.S. Navy uses the Schneider test, which relies on blood pressure variation lying and standing, and on the effect of exertion on the pulse-rate. It is noteworthy that at a great flying school 66 per cent. of the accidents happened on Mondays or on days after holidays. Lieut. Neuberger urges that the medical officer should not be regarded by the aviator as an

evidence of osseous regeneration; in some others there was slight evidence of improvement, while the rest were doubtful or negative. The number of teeth treated was only eight; this is explained by the difficulty of obtaining bacteriological coöperation. The radiographic test is certainly not very satisfactory, for to compare films of the same tooth taken at intervals and to interpret any differences as valid evidence of anatomical change is to leave out of account various factors concerned with radiographic technique which may easily vitiate the results. A better method which might be possible in a few cases would be to select teeth showing apical rarefaction and to treat them with cultures of *B. bulgaricus* and then to trephine the bone and examine the peri-apical tissues bacteriologically, but it might not be easy to find patients willing to submit to the test even in the cause of science. The results of both Moxham and Wilkinson are sufficiently hopeful to deserve further investigation. The careful coöperation required between dentist, radiologist, and bacteriologist makes it essentially a study to be carried out in a dental hospital. The pulpless tooth forms one of the most important problems in modern dentistry to-day, and any method which might promise a solution compatible with the retention of these teeth in a healthy condition is worth investigating on an extensive scale.

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[1] La Riforma Medica, June 2nd, 1924.

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THE salutary effects of the sun are commonplace knowledge in these days as they were in ancient times, when even the caves which served as dwelling places were chosen where they faced the south. Among the Romans exposure to sunlight was held to be not only a remedy but a valuable hygienic measure, and Hippocrates, Celsus, and Galen prescribed sun-baths in certain diseases. At the present day the practical application of this remedial agent has been vastly extended, and good results have been obtained in a large sphere of diseases, such as tuberculosis, leukæmia, Basedow's disease, epithelioma and dermato-syphilis. Dr. Gino Murero, of the dermato-syphilitic clinic at Bologna, publishes[1] five cases of suppurative inguinal adenitis from venereal ulcers, which tend to show that distinct beneficial effects can be obtained in intractable cases by exposure to solar rays. His technique is to choose the morning hours for the exposure, especially in the months of July and August, when the temperature is less high than during the rest of the day, thus avoiding disturbances and profuse sweating caused by excessive heat, and also because in the morning hours the atmosphere is clearer and does not absorb so many ultra-violet rays. The diseased part is exposed directly to the sun while the patient lies on a bench, the rest of the body being suitably protected by coloured curtains. The only application used was sterilised gauze. In all the five cases improvement took place almost at once after four or five sittings, but the healing process increased about the ninth or tenth exposure with the disappearance of the œdema and of the bluish-red tint of the edges, and with the elimination of the necrotic patches, which are usually seen at the base of the ulcer, and their replacement by healthy granulations and consequent transformation and diminution of sanious discharge. Cure was usually complete after 25 sittings. It is worth while drawing attention to these results, because such abscesses as sequelæ of ulcers, due to Ducrey's bacillus, by their resistance to ordinary methods of cure, are the cause of much physical suffering and expense to the patient. No special technique is needed, nor is any exclusive locality absolutely indispensable for the treatment; the patient can obtain the cure of his disease wherever there is possibility of exposing the affected parts of the body to the sun's rays. Medical observation and control, it need hardly be said, are absolutely necessary if uneventful cure is to be assured.

THE PREVENTION OF AEROPLANE CRASHES.

THE aviation display at Hendon last Saturday passed off without mishap. The mechanical efficiency of modern planes will be given the chief credit for this gratifying circumstance; but according to the figures set out in a well-reasoned contribution to the U.S. Naval Medical Bulletin for March, praise should be offered rather to the qualities of quick judgment and resolute decision possessed by the British and French aviators who took part. Under the title of "Aviation Accidents and Methods of Prevention" Lieutenant J. F. Neuberger, Medical Corps, U.S. Navy, who has been serving in the flagship of the Aircraft Squadrons Scouting Fleet, discusses the lessons to be learnt from the statistics collected. The causes of investigated crashes in the experience of the U.S. Navy in 1922 were physical and mental defect, 60 per cent.; insufficient knowledge and experience, 10 per cent.; mechanical (plane or motor), 24 per cent.; weather, 4 per cent.; unavoidable, 2 per cent. The chief cause of crashes is thus some mental defect, including error of judgment, in the aviator himself. It is pointed out that slowness of reaction time should be recognised during the medical examination of the candidate for the Air Force; the slow-reacting man might just as well be disqualified then, or when undergoing recruit training, as later. At this stage he will not have killed anyone or caused loss to the public by damaging expensive machinery. Most men learn to fly in eight hours; why trouble to accept those who cannot learn under 10? Medical officers of aviation units should be officers who themselves fly, are keen on flying, and understand the aviators' difficulties. A flight surgeon should be told off to go through the recruit's course with each batch under instruction, that he may know the individuals intimately, and be able to estimate their flying ability with full understanding. Medical observation should not cease when they are graded pilots, but should be continuous until they fly. The U.S. Navy uses the Schneider test, which relies on blood pressure variation lying and standing, and on the effect of exertion on the pulse-rate. It is noteworthy that at a great flying school 66 per cent. of the accidents happened on Mondays or on days after holidays. Lieut. Neuberger urges that the medical officer should not be regarded by the aviator as an

evidence of osseous regeneration; in some others there was slight evidence of improvement, while the rest were doubtful or negative. The number of teeth treated was only eight; this is explained by the difficulty of obtaining bacteriological coöperation. The radiographic test is certainly not very satisfactory, for to compare films of the same tooth taken at intervals and to interpret any differences as valid evidence of anatomical change is to leave out of account various factors concerned with radiographic technique which may easily vitiate the results. A better method which might be possible in a few cases would be to select teeth showing apical rarefaction and to treat them with cultures of *B. bulgaricus* and then to trephine the bone and examine the peri-apical tissues bacteriologically, but it might not be easy to find patients willing to submit to the test even in the cause of science. The results of both Moxham and Wilkinson are sufficiently hopeful to deserve further investigation. The careful coöperation required between dentist, radiologist, and bacteriologist makes it essentially a study to be carried out in a dental hospital. The pulpless tooth forms one of the most important problems in modern dentistry to-day, and any method which might promise a solution compatible with the retention of these teeth in a healthy condition is worth investigating on an extensive scale.

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[1] La Riforma Medica, June 2nd, 1924.

MIDWIVES AND JURY SERVICE.

THE Home Secretary, having been approached by the Ministry of Health with regard to the liability of women working as midwives to serve on juries, has sent a circular letter on the subject to the under-sheriffs. It is pointed out that the question of legislation to secure general exemption for all midwives in virtue of their calling will be considered when a suitable opportunity presents itself. The circular contains sympathetic reference to the undoubted need of midwives for special consideration in view of the necessary urgency of calls upon them for their attendance at confinements. Further, the Home Secretary expresses the view that in practice midwives are excused from service when their aid is urgently required, and suggests that upon under-sheriffs being satisfied that a certified midwife has given notice to a local supervising authority of her intention to practise as such, a mark should be placed against her name in the jury book so as to prevent a summons being sent to her. If the terms of this instruction or suggestion are complied with, it seems that midwives will have no further ground for complaint. By a schedule to the Juries Act, 1870, a large number of classes of persons are exempted from jury service, including peers, Members of Parliament, judges, clergymen, and ministers of religion as defined by the schedule, barristers, solicitors, and various other persons engaged in the practice of the law. All registered medical practitioners and pharmaceutical chemists are also exempt, as well as officers of the navy, army, and other services, civil and otherwise, including police officers and justices of the peace.

SPLANCHNIC ANÆSTHESIA.

IN a visit to a continental surgical clinic nothing is more likely to strike an observer than the contrast of the methods of anæsthesia there adopted with those prevalent in our own operating theatres. On the Continent a reliance is commonly placed on methods of local and regional anæsthesia, whilst the skilled technique of general anæsthesia to which we are accustomed does not seem to have been developed. Yet the very skill of our own anæsthetists has largely blinded us to the undoubted advantages of local methods. As Crile pointed out, the protection of the subconscious centres is of vital importance and can only be effectively carried out by a local nerve-block. The method of splanchnic anæsthesia has been extensively used on the Continent, and the article which we publish this week, by Mr. Stanley Hillman, gives examples of its remarkable possibilities. The technique of the method is simple, though it requires accuracy of execution, and the resulting block is so complete that even the largest operations can be carried out without pain and with an absence of shock unapproached in other methods. The method consists in the injection of about 50 c.cm. of 1 per cent. novocaine into the region of the semilunar ganglia, a very fine needle being inserted on either side of the first lumbar vertebra for the purpose. A preliminary aspiration ensures that a vessel has not been entered. Not only can extensive operations on the stomach be then conducted without pain or shock, but this inhibition may persist for long after the operation is concluded and well into the period of convalescence. Brunn and Mandl in the *Wiener klinische Wochenschrift* of May 22nd, 1924, describe another remarkable use of this inhibition of the sympathetic nerves. Injecting at different levels in the dorsal region so as to block the rami communicantes of the sympathetic ganglia, they have succeeded in cutting out afferent impulses from various organs, such as the gall-bladder and kidney. They suggest the use of the method as a means of differential diagnosis between lesions of the different viscera, but they also consider that the injections may in certain circumstances have an actual curative effect. The cutting of the reflex which results relieves spasm of the musculature of the viscus, and the cases they describe suggest that under these circumstances a gall-stone may be passed or a kidney recover its inhibited function. The method appears to open up a new field and its development will be followed with interest.

MOSQUITO CONTROL AT HAYLING ISLAND.

A PIECE of interesting and useful health work about which too little is known has for several years been carried out at Hayling Island in Hants. It is concerned with the amelioration of the mosquito pest in the neighbourhood and owes its origin and much of its success to the enthusiasm and efforts of Mr. J. F. Marshall, F.E.S. He and the members of the executive committee of the Mosquito Control association have issued a third report which gives an account of the work accomplished from May, 1923, to May, 1924. It is a well-illustrated pamphlet of 12 pages which, after certain remarks on mosquitoes generally and the methods employed for their reduction, considers in some detail the objects of the Hayling Mosquito Control. This was organised in 1920 to cope with the intolerable mosquito nuisance so prevalent at a large number of summer resorts along the coast-line of Dorset, Hampshire, Sussex, and Kent. A laboratory was established at Hayling Island and investigations showed that the chief mosquito culprit was *Ochlerotatus detritus*, a salt-marsh breeder. Aided by *Ochlerotatus rusticus*, the larvæ of which are found in the stagnant fresh water of field and roadside ditches, and by *Theobaldia annulata*, whose larvæ have a liking for foul waters contaminated by sewage or other refuse, this mosquito does its best to make life miserable by its blood-sucking propensities. It has a greater range of flight than either of its two "non-salt" congeners, but the latter are often a cause of serious annoyance, and the Hayling Mosquito Control plead for the assistance of local sanitary authorities and of landowners not only against these insects, but with respect to *Culex pipiens*, the common "domestic" gnat which, though probably less blood-thirsty than the other species, yet merits attention. The intensive work of the Control against *Ochlerotatus detritus* is indicated by an excellent map of the "Salterns" area of Hayling Island, and it is gratifying to find how much has been accomplished in the way of abolishing mosquito nurseries. White Cross disinfectant in a strength of 1 part in 30,000 has been found useful as a larvicide, and water thus treated is harmless if drunk by human beings or animals. A good deal of drainage has been carried out, and it is noteworthy that the Control has received monetary support for its operations from the Ministry of Health

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Pityriasis Simplex.—Pityriasis simplex may occur in children, not infrequently in infants, in whom it often first makes its appearance in the form of rings. It is, however, chiefly seen in adults, particularly in men. It is generally due to bacterial infection, the infecting agent being probably the bottle bacillus, but in some cases it is due simply to a deficiency in the normal oil secreted by the skin glands, as, for example, in xerodermia. A differentiation between the two types is not always easy, but the general dryness of the rest of the skin and hair should favour a diagnosis of the latter type. Microscopic examination of the scales is helpful but not conclusive, as the bottle bacillus is a normal saprophyte of the scalp.

Treatment will vary in the two conditions. It is obvious that if the skin is too dry repeated washings are not likely to help, whereas if a bacterial infection is present these may be of considerable value. In the former case, therefore, in boys and men, it is best to confine washing of the scalp to once a week, and to give some slightly oily preparation to replace the missing oil of the skin. In women, washing the head once a fortnight will usually suffice. In mild cases it is better to give a lotion containing a small amount of oil, such as will be described presently, while in the more severe cases it will be advisable to use an ointment. In women the lotion should always be used.

In the bacterial cases washing should be more frequent, twice to three times a week in men, and once a week in women. Ext. quillaiæ liq. (B.P.C.) is an excellent shampoo lotion, but any good soap may be used for the purpose. Medicated soaps have no special value and the stronger spirit soaps are better avoided. Mild antiseptic lotions should be applied daily: resorcin is one of the best, but should not be used in people with white or fair hair, as it stains a greenish colour. A usual formula is: ℞ Resorcin ʒi., sp. coloniensis ℥i., ol. ricin. ʒii., aquam ad ℥viii. Hydrarg. perchlor. gr. ii., or chloral hydrate ʒi., may be substituted for the resorcin or combined with it if desired. These lotions should be massaged into the scalp once daily, and always after washing the scalp. In more severe cases it may be necessary to prescribe an ointment. The best basis for this is the combination of soft paraffin and cocoanut oil suggested by Whitfield, which is not messy and is easily washed out of the scalp; it has the disadvantage of getting very liquid in hot weather, and though this does not limit its efficacy it makes it difficult of transport. The best antiseptics to use are sulphur and salicylic acid, and a useful formula is: ℞ Ac. salicyl. gr. xv., sulphur. sublim. gr. xv., ol. lavand. ♏iv., paraff. moll. ʒii., ol. cocois nucifer. ad ℥i. Crocker's formula of resorcin, sulphur, and thymol, prescribed as ℞ Ung. thymol. co. dilutum (B.P.C.) is also very useful, but has a lanoline basis which is disagreeable to some people. In this condition, too, it is rarely necessary to use ointments in women.

Pityriasis Steatoides. — Pityriasis steatoides is merely an exaggerated form of the bacterial type of pityriasis simplex with some exudation. The scales are greasy and more profuse, but there is no associated redness of the underlying scalp. Sabouraud considers that in this condition the infection is due to the bottle bacillus acting in symbiosis with the *Coccus cutis communis*. The treatment is the same as for the last-named condition, but caution is required to prevent irritation of the scalp or an acute seborrhœic dermatitis may be precipitated. In addition to the drugs already mentioned, tar is of considerable value: it may be used alone or in combination with other antiseptics. A good formula is ℞ Anthrasol gr. xx., ac. salicyl. gr. v., paraff. moll. ʒii., ol. cocois nucifer. ad ℥i.

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Seborrhœa Capitis.

This is a state of excessive oiliness of the scalp, and varies from a slight greasiness of the hair to a condition in which the hair follicles are filled with greasy plugs, and the scalp is covered with a fatty exudate. The condition is due to over-activity of the sebaceous glands, and may occur alone or in conjunction with pityriasis steatoides. It usually begins about puberty, being most severe in early adult life and diminishes thereafter as age advances. Certain metabolic disturbances may be partly responsible for the condition, though racial and familial influences also play a part, and it is therefore necessary to rectify, if possible, any general metabolic disturbance, particularly by regulating the diet. Local treatment consists of frequent washing of the scalp, as described above, and the application of astringent and antiseptic preparations. The most suitable are alcoholic lotions. Greasy preparations should obviously be avoided. Useful formulæ are: ℞ Resorcin ʒi., acid. acetic ℥ss., sp. vin. rect. ℥ii., aq. rosæ ad ℥viii.; or hydrarg. perchlor. gr. ii., sp. coloniensis ℥i., sp. vin. rect. ℥iii., aquam ad ℥viii.; or liq. calcis sulphuratæ (B.P.C.) ʒi., glycerin. ʒi., aquam ad ℥viii.

Loss of Hair.

Apart from general alopecia of the scalp, due to some acute illness, from alopecia areata, or from localised baldness due to inflammatory conditions of the scalp, loss of hair can roughly be divided into two groups: (1) calvities, which is only seen in the male, and consists of a progressive loss of hair, commencing on the crown of the head and the frontal region and going on to complete baldness of the top of the head; and (2) a general thinning of the hair, often most marked on the vertex, which is most commonly seen in women from the age of 30 onwards. The first-named condition is most frequently seen in middle-aged and old men, but in the premature form complete baldness of the crown may have taken place in the early 'twenties. This condition is thought by enemy, but as an adviser who saves him from accidents and teaches him how to master conditions which may lessen his efficiency, cause his retirement, and shorten his life. The author discusses in detail safety helmets, goggles, clothing, protective padding of machines against injuries, parachutes, and swimming jackets; he pleads for the provision of (1) a first-aid box, and (2) food and water in every plane, and asserts the need for an inquiry into every crash by a board, on which shall sit a medical officer, charged with the duty of examining the aviator's medical record, to see if an explanation of the disaster can be found there.

ACCLIMATISATION IN THE TROPICS.

IN presenting the play "White Cargo," which is now being performed in London, the author, Leon Gordon, states that he has made no conscious effort to create or eliminate sensationalism, but has attempted to portray the struggle for development in a country which steadily defies the encroaching civilisation, and where the reaction of an ever-shining sun breeds inevitable rot—a rot which penetrates not only the vegetation and inanimate objects, but the minds and hearts of the white men who attempt to conquer it. The symptoms of mental and physical decadence produced by residence in a hot and malarious district are, indeed, well reproduced. Acclimatisation in such an isolated and unhealthy area may mean simply mental and physical deterioration. A treatise,[1] published recently by a French author, reaches a similar conclusion as regards physique and morale in the tropical French colonies. He states that sojourners in the French tropics compare unfavourably with those in the British tropics, the chief reason being the lack of active exercise in the former. The Britisher plays games regularly all the year round, whereas the French colonist leads a uniform sedentary life. Possibly the Britisher is nearer to true acclimatisation thereby.

Perhaps in its most exact meaning acclimatisation is the process of becoming accustomed to a new climate and its conditions, with maintenance of full physical and mental vigour. The main difficulties in the way of acclimatisation in the tropics are evil influences of climate per se, parasites, unhygienic conditions, altered habits of life, altered social states, sedentary routine, over-indulgence in food, and last but not least, alcohol. Many have seen the tableaux in the Tropical Health section housed in the pavilion of His Majesty's Government at Wembley. These demonstrate how, by human effort intelligently directed, the "white man's grave" of 25 years ago has become a centre of health and prosperity. Indeed, there exist some tropical cities from which all the opposing influences enumerated, with the exception of climate, have been eradicated, at least in so far as some white men are concerned. Having reached this advanced state of sanitary and moral excellence, are we in a position to say that these white men have become fully acclimatised in the sense defined above? Judging from the evidence reviewed recently by such authorities as Prof. van Eijkman and Dr. Andrew Balfour, the answer must be No. In spite of our success in stamping out malarial and such-like parasites, and in introducing all kinds of outdoor and indoor exercise and other healthy recreation, there still remains the depressing effect on the nervous system with its states of exhaustion and psychical irritability, for which the only cure is a prolonged vacation in a temperate clime. Possibly we are now just beginning to see clearly these effects on the efficiency and nervous mechanisms of the white man, because formerly such symptoms were masked by concomitant tropical disease due to known bacteria and parasites. Very probably these nervous effects are due to continuous heat, although we must not forget the possibility of an unknown bacterial or parasitical agent. At present it would appear that brain-work, with its more sedentary and indoor conditions, leads sooner to nervous symptoms than an outdoor occupation such as planting. It is only by a clear understanding of the present position that we shall make any real advance towards maintaining our fellow countrymen in the tropics in the full mental and physical vigour to which they have been accustomed at home, and which alone spells content to the white man.

MEMORIAL TO THE LATE SIR WILLIAM MACEWEN.

THE movement, which took formal shape a month ago, in favour of the commemoration of the life and work of the late Sir William Macewen, was carried a stage further at a meeting of the General Committee of the Memorial Fund, held on June 26th, in the Hall of the Royal Faculty of Physicians and Surgeons, Glasgow. At the original meeting, held on May 22nd, it had been remitted to an executive committee to consider and report on the form or forms which the memorial should take. The executive were now able to present a unanimous report, which, with very slight verbal alteration, was adopted by the General Committee. It is proposed to apply the funds that may be raised to three main purposes, in the following order: 1. The provision of a bust of the late Sir William Macewen, by a sculptor of eminence, with a replica for presentation to Sir William's family. It is intended that the bust shall be placed in the University. 2. The establishment of a memorial lecture, or prelection, to be called the "Sir William Macewen Lecture, or Prelection"; this lecture to be delivered annually, or biennially, as funds may permit. It is intended, further, that this lecture should not be merely a memorial oration, but should deal with any branch or aspect of surgical science. 3. The foundation of a Macewen medal or prize in surgery, to be awarded annually. The decision as to whether this should be assigned to the class of surgery at Glasgow University or should be given a wider application has been deferred for further consideration. A preliminary report as to the probable cost of the bust and replica was made by Dr. A. Freeland Fergus, on behalf of the executive, and the General Committee desired the executive to make such arrangements as may be required to carry through the scheme. It was intimated that already a number of substantial subscriptions have been secured, though no circular has yet been issued. The executive of the Memorial Fund consists of the following: Dr. A. Freeland Fergus (chairman), Sir Hector C. Cameron, Sir John Reid, Prof. T. K. Monro, and Mr. J. H. Pringle (vice-chairmen); Colonel J. A. Roxburgh, Mr. William Gray, Prof. Graham Kerr, Prof. W. K. Hunter, Sir Archibald Craig, Dr. J. N. Marshall, Dr. George A. Allan, Dr. J. G. McCutcheon, Mr. James MacFarlane (treasurer), and Mr. Archibald Young (secretary). In view of the present holiday season, it was resolved that the executive should defer the issue of a circular until a little later in the year. The committee is prepared, however, to receive subscriptions now, and such subscriptions should be sent to the Hon. Treasurer of the Memorial Fund, Wesleyan-street, Glasgow.

WE regret to announce the death on June 30th, at the age of 69, of Prof. Charles Hunter Stewart, who held the Chair of Public Health at the University of Edinburgh.

THE following have been elected as members of the Dental Board of the United Kingdom: To represent qualified dentists, for England and Wales, Mr. W. H. Dolamore and Mr. W. R. Ackland; for Scotland, Mr. W. Guy; and for Ireland, Mr. J. J. Andrew. Mr. F. Butterfield and Mr. W. F. Bowen have been elected to represent dentists registered under the Act of 1921.

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[1] Les Blancs en pays chauds. Déchéance physique et morale. By Jaureguiberry. Paris: A. Maloine et Fils. 1924. Pp. 60.

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Seborrhœa Capitis.

This is a state of excessive oiliness of the scalp, and varies from a slight greasiness of the hair to a condition in which the hair follicles are filled with greasy plugs, and the scalp is covered with a fatty exudate. The condition is due to over-activity of the sebaceous glands, and may occur alone or in conjunction with pityriasis steatoides. It usually begins about puberty, being most severe in early adult life and diminishes thereafter as age advances. Certain metabolic disturbances may be partly responsible for the condition, though racial and familial influences also play a part, and it is therefore necessary to rectify, if possible, any general metabolic disturbance, particularly by regulating the diet. Local treatment consists of frequent washing of the scalp, as described above, and the application of astringent and antiseptic preparations. The most suitable are alcoholic lotions. Greasy preparations should obviously be avoided. Useful formulæ are: ℞ Resorcin ʒi., acid. acetic ℥ss., sp. vin. rect. ℥ii., aq. rosæ ad ℥viii.; or hydrarg. perchlor. gr. ii., sp. coloniensis ℥i., sp. vin. rect. ℥iii., aquam ad ℥viii.; or liq. calcis sulphuratæ (B.P.C.) ʒi., glycerin. ʒi., aquam ad ℥viii.

Loss of Hair.

Apart from general alopecia of the scalp, due to some acute illness, from alopecia areata, or from localised baldness due to inflammatory conditions of the scalp, loss of hair can roughly be divided into two groups: (1) calvities, which is only seen in the male, and consists of a progressive loss of hair, commencing on the crown of the head and the frontal region and going on to complete baldness of the top of the head; and (2) a general thinning of the hair, often most marked on the vertex, which is most commonly seen in women from the age of 30 onwards. The first-named condition is most frequently seen in middle-aged and old men, but in the premature form complete baldness of the crown may have taken place in the early 'twenties. This condition is thought by

Sabouraud to be mainly due to seborrhœa capitis; many other factors have been invoked, of which heredity is the chief, but it is quite clear that no theory is completely satisfactory. A great deal can be done by preventive treatment, but this, to be of any value, must be commenced at an early age. In fact, general attention to the hygiene of the scalp from childhood is the best preventive of premature alopecia. This should consist of regular weekly washing of the scalp. The hair should be kept fairly short, and undue dryness or greasiness dealt with on the lines suggested above. Each individual should use only his own brush and comb, which should be washed frequently. The brush should not be too hard. People should be encouraged to patronise only those hairdressers who sterilise their instruments between each customer, and who provide a freshly sterilised brush for each individual. All violent treatment of the scalp, as by the machine-brush, should be condemned. The use of hair lotions, &c., of unknown composition should be avoided. When any evidence of excessive hair loss appears, gentle massage of the scalp may be practised and rubifacient lotions used, a favourite one being: ℞ Acetum cantharides ʒii., sp. coloniensis ℥ss., sp. vin. rect. ℥iss., aquam ad ℥viii. Pilocarpine is claimed to have a specific action, and may be used as follows: ℞ Pilocarpin. nitr. gr. xx., sp. rosmarin. ℥ss., alcohol (60 per cent.) ad ℥viii. There is little evidence that any of the many vaunted remedies for this type of baldness—vibro-massage, high frequency, &c.—have any definite action; the first-named may occasionally set up an acute seborrhœic dermatitis. Ultra-violet light, by producing hyperæmia of the scalp, may have a slight action in stimulating hair growth, but it requires to be handled with very great care. There is no reliable evidence forthcoming of the value of internal remedies in this condition.

While this type of alopecia does not appear to be associated with any derangement of the general health, the general thinning of the hair seen commonly in women is often associated with some general disturbance. Disturbances of function of the nervous system, the genital organs, the gastro-intestinal tract, or the thyroid may be associated with hair loss. Apart from correcting these errors, the scalp should be kept in a healthy condition on the lines already indicated. Doubtless in a few years' time it will be unnecessary to differentiate between the sexes, but at the present time for those girls who wish to let their hair grow long, careful brushing night and morning will help to keep the hair in good condition.

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Physician in charge, Skin and Venereal Disease Departments, University College Hospital.

THE appointments held by Mr. F. A. Williamson-Noble, the author of No. LXXVII. of this series, on the Treatment of Conjunctivitis, are assistant ophthalmological surgeon to the Westminster Hospital and assistant surgeon to the Central London Ophthalmic Hospital, and not as previously stated.

TREDEGAR HOSPITAL, MONMOUTHSHIRE.—A new operating theatre, the gift of the directors of the Tredegar Iron and Coal Company, has been added to the Tredegar Hospital, Monmouthshire.

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Special Articles.

DISINFECTION BY THE MUNICIPALITY AND BY THE HOUSEWIFE IN SCARLET FEVER AND DIPHTHERIA.

A CONTRAST.

BY DUNCAN FORBES, M.B.E., M.D., CH.B., B.SC. EDIN., D.P.H.,
MEDICAL OFFICER OF HEALTH FOR BRIGHTON.

IN the 'eighties and 'nineties and the first few years of this century the infections of scarlet fever and diphtheria were believed to be conveyed largely by direct contact with clinical cases and in no small degree by infected articles. To control the spread of these diseases fever hospitals were built for the isolation of patients and careful disinfection followed the removal of the patient to hospital. The campaign to stamp out these two diseases was carried on with commendable vigour. Even only children who could have a room to themselves and be looked after by their mother at home were sent into the fever hospital, and the higher the percentage removal to hospital the more hopeful was the medical officer of health of controlling spread. Disinfection was also thoroughly carried out, the patient's and mother's clothing, the mattress and bedding, the contents of wardrobes, chests of drawers, boxes, all curtains and hangings, and carpets were removed for disinfection by steam, and the walls, ceiling, and floor of the room were sprayed with disinfectant. When a return case was reported a systematic search was made for articles which had not been disinfected and had been taken out on the return home of the patient, as these non-disinfected articles were considered probable causes of return cases.

With the failure of isolation in hospital and of thorough disinfection to stop the epidemic prevalence of these diseases, with increased evidence of the dangers arising from the carrier and the missed case—more dangerous than the clinical case because of their wider sphere of action—the hospital came to be considered as a convenient, although expensive, centre for the treatment of these diseases and only necessary for isolation in special cases—for instance, from boarding houses, resident schools, the families of milkmen, teachers, overcrowded houses, and so forth. Disinfection for the same reasons was less and less considered an important factor in the prevention of spread, especially as proof accumulated that the organisms of many acute diseases are delicate and die quickly outside of the body. For these reasons fewer articles were removed for steam disinfection, carpets, hangings, and even the mother's dress were disregarded, and in many cases only the bedding, including the mattress, and the personal clothing were removed. Similarly spraying of rooms became less common and was in some cases replaced by a perfunctory disinfection by gas, the latter in order that something could be said to have been done.

In substituting cleansing and disinfection by the housewife for municipal disinfection I was influenced by the considerations set out above, chiefly perhaps by picturing immense numbers of constantly escaping active organisms in the carrier and comparing these with scattered organisms living under adverse conditions outside the body and dying in great numbers. My conclusion was that infection was due to the reception of organisms in massive dose from hands, handkerchiefs, towels, and such-like, and within a short period of their escape from the carrier. Having come to this decision, I consulted two well-known bacteriologists, who agreed that in scarlet fever and diphtheria the present methods of disinfection might safely be discontinued. Further, in conversations with other medical officers of health, I found that most agreed that mattress disinfection usually accomplished no useful purpose and that the spraying of walls was unnecessary.

Instructions as to Cleansing and Disinfection after Scarlet Fever and Diphtheria.

The first step taken in 1909 was the stopping of the steam disinfection of the bedding and mattress, when a pamphlet of instructions to the following effect was left with the parent:—

As the infection comes chiefly from the throat and nose the following measures must be taken immediately after the removal of the patient.

1. All bedclothes and particularly sheets, pillow-slips, and handkerchiefs which are in *contact with the nose and mouth* must be put into water at once and washed,* linen and cotton goods being brought to the boil in soapy water. The above applies equally to the attendant's clothes.
2. All feeding and drinking utensils used by the patient must be kept apart and be placed in boiling water for five minutes and then be thoroughly rinsed and cleansed.
3. All pens, pencils, toys, and books used by the patient whilst ill are best burnt if of little value. On the other hand, if the parents prefer it (*a*) pens and pencils can be put in boiling water for a few minutes; (*b*) many toys can be boiled or thoroughly washed. Books are difficult to disinfect, so if of value, or if they belong to a library, the parents should have them called for from this office.

The Rooms Used by the Patient must be Spring-cleaned.

If the above instructions are carefully attended to there is no need to spray or fumigate the bedroom or to move bedding for steam disinfection; such spraying and stoving will only be undertaken if the cost is paid in advance. When the inspector calls to see that cleansing has been thoroughly carried out he will be pleased to advise on any doubtful point.

* To send goods *which have been exposed to infection* to a laundry except notice is given that they have been exposed to infection and except proper precautions are taken in transmission, renders the sender liable to prosecution.

An 11 years' trial was given to this experiment and then, in May, 1921, a further step was taken. Up to that time rooms had been sprayed, thereafter even that was stopped.

Much discussion has recently taken place as to the advisability of giving up municipal disinfection, and I am surprised to find how little is claimed for it by those who advocate its continuance. Briefly, their argument is as follows: "Disinfection by the local authority may not do much good, it cannot do harm; even if it saves an occasional case which will not affect the position statistically it is still worth doing." I venture to disagree with these statements. In the first place I think that reliance should be placed on the available statistics until further proof is forthcoming. It is for this reason that I have set out shortly the Brighton figures collected over many years.

Brighton Statistics.

A = Disinfection by the municipality, 1900–09 inclusive.
B = Municipal disinfection stopped but rooms sprayed, 1910–20 inclusive.
C = Disinfection and cleansing entirely by housewife, 1921–24, three years.

—	Cases removed and cases per 1000 of population.	Day on which subsequent case occurred—					Total after seventh day.
		0–7	8–14	15–21	22–35	35 +	
A	2103 Per 1000	85 40·4	18 8·6	10 4·8	5 2·4	4 1·9	37 17·6
B	3027 Per 1000	119 39·3	27 8·9	12 4·0	7 2·3	5 1·6	51 16·8
C	752 Per 1000	21 27·9	10 13·3	2 2·7	— —	1 1·3	13 17·3

These statistics, so far as they go, show that disinfection by the local authority presents no advantages over cleansing. The figures are small, and it would be absurd to consider that they prove conclusively anything one way or other, but they are the only figures available to me and they are sufficient to provide reasonable grounds for the trial of cleansing and disinfection by the housewife in other towns. That is really all I hope for—namely, that the experiment will be given a fair trial in a number of towns and that all of us will keep an open mind on the subject until the accumulation of figures leaves no reasonable ground for doubt as to which method is the better. In this connexion I would suggest that the Ministry of Health or the Society of Medical Officers of Health should arrange for the collection of statistics from many towns, the medical officers of which agree to follow out one or other method strictly.

The "disinfectors" no doubt will say, "Why abandon disinfection which can do no harm?" The reply is, "It is not proved that the orthodox method does no harm." Personally I believe that it may do serious harm. A child is removed to hospital and the floor and walls of the bedrooms, and it may be the living-room, are thoroughly wetted What more likely in winter, when these diseases are most prevalent, that carriers develop colds and become more infectious. Also the disinfection leads frequently to the closing for the following night of the child's bedroom and the crowding of the other members of the family together, again adding to the danger of infection from the carrier. But apart from this and of greater importance is the fact that the public are not educated and are given a false sense of security. They say, "Disinfection has been thoroughly carried out at great expense and trouble, what more is wanted?" On the other hand, when no disinfection is carried out by the municipality the public learn to rely on themselves, they learn what is the chief danger, and how they themselves can help in preventing the spread of the disease; they receive no sense of false security, and in our experience are the more willing to be taught. In addition, I need hardly point out that the funds available for health work at the present time are limited and that money spent in disinfection curtails work in other directions.

It is admitted that it is a hard thing to abandon old customs and to admit that for years money may have been spent needlessly and advice may have been wrongly given, but persistence in a doubtful course will do more harm to our prestige in the long run than a sincere endeavour to get at the truth and act accordingly whatever the immediate consequences.

TUBERCULOSIS.

Vaccination against Tuberculosis.

Dr. A. Calmette has long urged the view that the control of tuberculosis depends on preventing the dissemination of the bacilli by treating every tuberculous man or animal, however slightly affected, as a potential source of danger and on being able to protect artificially the susceptible individuals by some method of vaccination. The former part of his programme is largely a question of the cultivation of public opinion and the practicability of administrative control. The latter part depends in the first instance on animal experimentation, to which he has applied himself for many years with varying, but never really very substantial, success. He now, in conjunction with Dr. C. Guérin, reports[1] a series of observations on calves in which most encouraging results have been obtained. The animals received when quite young a large dose, 50 or 100 mg., of a non-virulent live culture subcutaneously and subsequently, at intervals varying from 1 to 18 months, resisted an intravenous dose of virulent organisms to which the controls all succumbed. The vaccinating strain was originally a very virulent bovine culture, which since 1908 has been continuously grown on potato cooked in ox-bile with 5 per cent. of glycerine. After 13 years and some 230 subcultures this strain was found to have lost virulence for all species of animals: 10 mg. will not infect a guinea-pig and by no route of introduct will it cause the formation of tubercles. On the hand, it has a certain amount of toxicity, tube of an ordinary potency can be prepared from

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[1] Annales de l'Institut Pasteur, 1921, xxxviii.

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THE CHOICE OF A MOTOR-CAR.

BY J. MARSHALL, M.I.A.E.,
LONDON MANAGER OF MESSRS. MANN, EGERTON AND CO., LTD., OFFICIAL CONSULTING ENGINEERS TO THE MEDICAL INSURANCE AGENCY.

THE choice of a car presents generally a difficult problem to the doctor. The type of practice, whether in town or country, and the state of the roads to be covered, whether the practice is in a flat or hilly district—these are among the many points which have to be carefully studied.

Initial Cost.

The price of the car is usually that which is considered first, and very often this must be arbitrarily decided without regard to other points involved. Even when but little capital is available, it must be remembered that to pay a good price may, for various reasons, be in the end more profitable than to buy a very cheap car, and with the deferred payment system described below it is not necessary to produce all the purchase money at once. Providing that the car selected is of sound workmanship and good repute, it will be found that the yearly depreciation is much lower in a more expensive car than in one of cheaper quality.

Depreciation.—The question of depreciation has some bearing on the type of body chosen. At the present time, owing to trend of fashion, the car with the best second-hand selling value is the saloon, and this appears likely to continue for some little time. Generally speaking, particularly in the larger type of car, the three-quarter landaulette, and especially the "all-enclosed" pattern, have extraordinary good second-hand value for many reasons. This car can be owner-driven and has a further market in that it can be used eventually for private hire work; it lasts considerably longer, and without undue rattle, than the coach-built "all-weather" or "cabriolet" type, which runs the saloon so closely in favour.

If a good car of the touring body type is bought with the intention to keep it during its lifetime, which should be at least 10 years, only 10 per cent. for depreciation need be allowed, as the car after that period will always bring some price. If, however, it is only intended to keep it for a few years, 20 per cent. will have to be allowed for the first year. On a car which costs approximately £500 there is a depreciation of some 20 per cent. each four years of its life, whereas a cheap car would depreciate very much more the first year. This applies particularly to American cars, which have to be depreciated at least 10 per cent. per annum more than the average British car.

American and British Cars: The McKenna Duties.

Owing to the larger horse-power of American cars in relation to their seating capacity and weight, they naturally use more petrol and oil, and are consequently more expensive to run than the smaller engined British car. The average small car up to 11 h.p. should do normally approximately 34 miles per gallon, but in the case of medical men stops are so frequent that petrol consumption cannot be reckoned on normal lines; and therefore I would not unduly stress this point as a factor in the choice of a car, but would rather consider the question on the lines set forth below. The price of petrol is, anyhow, so low that a few miles per gallon one way or the other is not very vital. Naturally, if a comparatively large car is decided on it must be realised at the outset that the costs of running will be considerably increased, particularly in the direction of licence and insurance, which are two of the heaviest dead charges that come against upkeep. There may be other factors to be considered, whose weight is not easy to assess, in connexion with the class of practice hoped for. A well-appointed car, larger and more luxurious in fittings than is really required, may be an asset to a practitioner in a fashionable neighbourhood, where it could only be an incubus to a man with a large panel practice or whose patients belong chiefly to the middle classes. Young consultants may be wise to spend more as initial outlay and should disregard small differences of running costs, whereas the general practitioner whose car will have continued hard use will not need a car with a large engine unless his work is scattered in a mountainous area. For the low speed and constant stopping involved in a morning round a car with from 10–15 h.p. will serve admirably, and for this class of work it is hardly worth while having a six-cylinder car of 20–40 h.p.

The position created by the proposed removal of the McKenna duties on August 1st has now been regularised, and no advantage can be looked for by delaying the purchase of a car until after that date. Prices have been settled on one or other of the following bases: (*a*) By the definite reduction and publication of the new prices; (*b*) by a guarantee to cover a drop in price between now and August 1st; (*c*) by an arrangement whereby cars can be purchased now at an agreed price and collected from bond on August 1st. These three clauses cover all foreign cars. In regard to the larger question of the British-made car, no reduction need be looked for; owing to reduced production prices are much more likely to be increased. Incidentally some misconception has been apparent in regard to the effect on retail prices of the removal of the McKenna duties; it was anticipated by the public that 33⅓ per cent. would be taken off the list price of the car, but probably the most that has been given is 10 per cent. It is permissible to point out that the duty of 33⅓ per cent. is taken off the actual manufacturing costs of the article in the country of its origin, whereas freights and costs of handling to this country were not affected. This explains the difference between the concession given by the manufacturers and the percentage of the tax removed.

Deferred Payments.

The deferred payment system can be recommended to those who do not feel disposed to release securities but prefer to pay for a car out of income. There are many forms of this system, which involve an increase of from 2½ per cent. to 4 per cent. on the original cost of the car with a 25 per cent. deposit or a 50 per cent. deposit, and the balance at 5 per cent. per annum spread over any time up to two years and may be payable by either monthly or quarterly instalments. No capital security for the purchase price is demanded, inquiry being addressed to the purchaser's bank merely to ensure that he is "good for" the monthly or quarterly sum payable. Providing a reasonable and honest firm is dealt with no trouble is likely to arise. On the other hand, it should be remembered that all payments due, whether monthly or quarterly, should be adhered to. If they are not, the car could be claimed back with the consequent loss to the purchaser of the whole of his deposits. In passing, it might be said that no reputable firm would insist on the strict letter of the law, but it is essential for the purchaser to bear this point in mind.

Income-tax deductions are allowed on some part of the instalments paid when the car is purchased on the deferred payment system. Each instalment must be split up for the purpose of income-tax into two portions, one portion being the amount estimated as a payment for the hire of the car until it becomes the property of the purchaser, and the other portion being the amount paid towards the purchase price. The best practice is to add up the total amount of all the instalments payable, and to deduct from this total the net cash price at which the car could have been bought outright. The difference between the two sums is the total amount attributable to hire, and it should be then split up and spread over the number of years during which the agreement is current.

it is antigenic in the sense that inoculation excites the formation of antibodies demonstrable by complement fixation. The test dose was 5 mg. of a virulent bovine culture injected into the jugular vein, the virulence being such that 1/250 mg. would kill a guinea-pig.

It remains to work out in detail the exact reasons why these experiments have succeeded where so many others have failed. It seems fairly clear that the most important factor is the introduction of live bacilli which will not cause infection but will survive in the tissues till they are destroyed by the natural processes of phagocytosis and digestion, through which foreign particles in the tissues are ultimately got rid of or are eliminated by the bowel or in milk. Dr. Calmette looks upon the relation of such organisms to the tissues of the host as of the nature of a symbiosis; so long as the bacilli live, so long will the host be stimulated to protect itself against either an outbreak of virulent bacilli, which may be lying latent somewhere in the body, or the introduction of infecting organisms from outside. But he regards the protection as dependent on the continued life of the vaccinating bacilli and advises that cattle should be dosed soon after birth and thereafter annually. Another point which may have helped to determine the successful issue is the large size of the vaccinating dose. There appear, however, to be no data to determine the influence of this factor or its relation to the duration of resistance.

The complete control of bovine tuberculosis would make a good deal of difference to tuberculosis in children. It may be that Dr. Calmette's vaccine will give comparable results when applied directly to human infection. There is no reason to doubt the soundness of the common belief that small doses of live bacilli in childhood do actually confer a certain amount of resistance to subsequent infection. Proposals have often been canvassed for reproducing this observational phenomenon in man; how far they have been actually tried is uncertain, though if any definite success has been achieved it has not been published. The complete loss of virulence of Calmette's bile culture seems fully established and its application to man is not beyond the bounds of reasonable human hygiene.

An Indictment of X Ray Treatment of Surgical Tuberculosis.

The discussion on actinotherapy in tuberculosis at a recent meeting of the Danish Medical Society in Copenhagen seems to have resolved itself, according to the official report,[2] into a spirited indictment and defence of X ray treatment. Dr. Axel Reyn, the head of the Finsen Institute, was the chief witness for the prosecution, and he was the better able to portray X ray treatment in a lurid light for having at his disposal many cases of X ray lesions sent to the Finsen Institute for repair. Finsen light, it would seem, is one of the best remedies for X ray burns and other X ray injuries, and it is therefore natural that the sins of all the Danish X ray specialists and X ray dilettantes should finally come to roost at the Finsen Institute. X ray treatment has been given at the Finsen Institute, as well as other forms of actinotherapy, but the results have not been so good as after treatment with concentrated or diffuse carbon arc-light. In the period 1910-20 there were 553 cases of tuberculous adenitis treated partly with the X rays and partly with carbon arc-light baths, supplemented by concentrated carbon arc-light on fistulæ. Recovery was effected in 98 per cent. of the cases treated with carbon arc-light, and in only 40 per cent. of the cases treated with the X rays. The arc-light bath was found to have a remarkably vitalising effect, restoring general bodily and mental vigour to the patient. Dr. Reyn was not in favour of abandoning X ray treatment altogether, and he suggested that in small doses, which were certain not to harm, they might be a useful supplement to other methods. Several of the speakers who followed him held very different views as to the dangers of X ray treatment, and one of them referred to re-examinations he had made of patients given X ray treatment between 1920 and 1922 for tuberculous glands. He had faced these patients again in fear and trembling, but he had been rejoiced to find that though an interval of at least a year and three months had elapsed since the X ray treatment had been given, there was no case in which serious X ray changes in the skin could be found. Both the opponents and supporters of X ray treatment found themselves on common ground when the discussion veered round to the dilettante radiologist. There were, of course, no dilettante radiologists speaking as such at this discussion, and there was not a discordant note when one speaker after another referred in terms more vigorous than polite to the physician who believes that he has but to purchase an X ray plant in order to blossom out as a radiologist.

The Papworth Tuberculosis Colony.

The last report of this colony, presented at the seventh general meeting, is full of the buoyant faith which have been among the chief sources of the colony's vitality. In almost every respect the colony has doubled itself since the preceding year, and there are now 196 persons settled in the village, including 70 children. Only in one of these 70 children has evidence of tuberculosis been found, and Dr. P. C. Varrier-Jones sees in this observation the prospect of rearing from tuberculous stock a new generation both tubercle-free and resistant to tubercle. The work allotted to the patients is never useless and is always chosen so as to suit the strength and inclinations of the patient, whose wages rise as his health improves and his working hours approximate to those of an able-bodied man. The inhabitants of Papworth need not ration their ambitions any more than a corporal in Napoleon's army, and as the ex-patient's skill increases, he has the opportunity to gain both financially and in status in his particular industry. "The big jobs are open to him as well as the small ones. There are no highly paid fit men acting as officials in the industries, all such posts are held by ex-patients. . . ." As in previous reports, Dr. Varrier-Jones gives an account of each of the main industries such as carpentry, poultry-farming, gardening printing, sign-writing, cabinet-making, upholstering, portmanteau and boot-making, tailoring, hand-made jewellery, and leather work. Almost every occupation seems to be represented at Papworth.

There is a point on which this report is not as communicative and instructive as it might be. It would be interesting to learn how many, or what proportion, of the patients entering Papworth settle there as permanent colonists. A clue, but only a clue, to this point is to be found in the statement that "the total number of inhabitants now settled in the village is 196. . . . The number of admissions to the central institution and Homeleigh during 1923 has been 222." Further information on this point would be of great value in estimating the approximate number of patients who would "make good" in colonies of this kind, supposing the Papworth model is accepted as satisfactory, and the copying of this model elsewhere is found desirable. It has been argued that many, perhaps most, consumptives sooner or later hanker for the comforts, or rather the discomforts, of their old homes, even though they be in squalid surroundings. To rub shoulders with the able-bodied man in the street and not always to be associated with one's fellow-sufferers are cravings which some patients experience. It is a pity that when the Anglo-Saxon acquires tubercle he cannot always discard his vagrant temperament.

DR. ATKIN SWAN MEMORIAL FUND.—A fund has been opened for a memorial to the late Dr. Charles Atkin Swan, with the object of endowing a Dr. Atkin Swan cancer bed at St. George's Hospital, London. The sum required is about £1000, and contributions may be sent to the fund at Westminster Bank, 1, Cavendish-square, W. 1.

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[2] Hospitalstidende, 1924, lxvii., 96.

THE CHOICE OF A MOTOR-CAR.

BY J. MARSHALL, M.I.A.E.,
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THE choice of a car presents generally a difficult problem to the doctor. The type of practice, whether in town or country, and the state of the roads to be covered, whether the practice is in a flat or hilly district—these are among the many points which have to be carefully studied.

Initial Cost.

The price of the car is usually that which is considered first, and very often this must be arbitrarily decided without regard to other points involved. Even when but little capital is available, it must be remembered that to pay a good price may, for various reasons, be in the end more profitable than to buy a very cheap car, and with the deferred payment system described below it is not necessary to produce all the purchase money at once. Providing that the car selected is of sound workmanship and good repute, it will be found that the yearly depreciation is much lower in a more expensive car than in one of cheaper quality.

Depreciation.—The question of depreciation has some bearing on the type of body chosen. At the present time, owing to trend of fashion, the car with the best second-hand selling value is the saloon, and this appears likely to continue for some little time. Generally speaking, particularly in the larger type of car, the three-quarter landaulette, and especially the "all-enclosed" pattern, have extraordinary good second-hand value for many reasons. This car can be owner-driven and has a further market in that it can be used eventually for private hire work; it lasts considerably longer, and without undue rattle, than the coach-built "all-weather" or "cabriolet" type, which runs the saloon so closely in favour.

If a good car of the touring body type is bought with the intention to keep it during its lifetime, which should be at least 10 years, only 10 per cent. for depreciation need be allowed, as the car after that period will always bring some price. If, however, it is only intended to keep it for a few years, 20 per cent. will have to be allowed for the first year. On a car which costs approximately £500 there is a depreciation of some 20 per cent. each four years of its life, whereas a cheap car would depreciate very much more the first year. This applies particularly to American cars, which have to be depreciated at least 10 per cent. per annum more than the average British car.

American and British Cars: The McKenna Duties.

Owing to the larger horse-power of American cars in relation to their seating capacity and weight, they naturally use more petrol and oil, and are consequently more expensive to run than the smaller engined British car. The average small car up to 11 h.p. should do normally approximately 34 miles per gallon, but in the case of medical men stops are so frequent that petrol consumption cannot be reckoned on normal lines; and therefore I would not unduly stress this point as a factor in the choice of a car, but would rather consider the question on the lines set forth below. The price of petrol is, anyhow, so low that a few miles per gallon one way or the other is not very vital. Naturally, if a comparatively large car is decided on it must be realised at the outset that the costs of running will be considerably increased, particularly in the direction of licence and insurance, which are two of the heaviest dead charges that come against upkeep. There may be other factors to be considered, whose weight is not easy to assess, in connexion with the class of practice hoped for. A well-appointed car, larger and more luxurious in fittings than is really required, may be an asset to a practitioner in a fashionable neighbourhood, where it could only be an incubus to a man with a large panel practice or whose patients belong chiefly to the middle classes. Young consultants may be wise to spend more as initial outlay and should disregard small differences of running costs, whereas the general practitioner whose car will have continued hard use will not need a car with a large engine unless his work is scattered in a mountainous area. For the low speed and constant stopping involved in a morning round a car with from 10–15 h.p. will serve admirably, and for this class of work it is hardly worth while having a six-cylinder car of 20–40 h.p.

The position created by the proposed removal of the McKenna duties on August 1st has now been regularised, and no advantage can be looked for by delaying the purchase of a car until after that date. Prices have been settled on one or other of the following bases: (*a*) By the definite reduction and publication of the new prices; (*b*) by a guarantee to cover a drop in price between now and August 1st; (*c*) by an arrangement whereby cars can be purchased now at an agreed price and collected from bond on August 1st. These three clauses cover all foreign cars. In regard to the larger question of the British-made car, no reduction need be looked for; owing to reduced production prices are much more likely to be increased. Incidentally some misconception has been apparent in regard to the effect on retail prices of the removal of the McKenna duties; it was anticipated by the public that 33⅓ per cent. would be taken off the list price of the car, but probably the most that has been given is 10 per cent. It is permissible to point out that the duty of 33⅓ per cent. is taken off the actual manufacturing costs of the article in the country of its origin, whereas freights and costs of handling to this country were not affected. This explains the difference between the concession given by the manufacturers and the percentage of the tax removed.

Deferred Payments.

The deferred payment system can be recommended to those who do not feel disposed to release securities but prefer to pay for a car out of income. There are many forms of this system, which involve an increase of from 2½ per cent. to 4 per cent. on the original cost of the car with a 25 per cent. deposit or a 50 per cent. deposit, and the balance at 5 per cent. per annum spread over any time up to two years and may be payable by either monthly or quarterly instalments. No capital security for the purchase price is demanded, inquiry being addressed to the purchaser's bank merely to ensure that he is "good for" the monthly or quarterly sum payable. Providing a reasonable and honest firm is dealt with no trouble is likely to arise. On the other hand, it should be remembered that all payments due, whether monthly or quarterly, should be adhered to. If they are not, the car could be claimed back with the consequent loss to the purchaser of the whole of his deposits. In passing, it might be said that no reputable firm would insist on the strict letter of the law, but it is essential for the purchaser to bear this point in mind.

Income-tax deductions are allowed on some part of the instalments paid when the car is purchased on the deferred payment system. Each instalment must be split up for the purpose of income-tax into two portions, one portion being the amount estimated as a payment for the hire of the car until it becomes the property of the purchaser, and the other portion being the amount paid towards the purchase price. The best practice is to add up the total amount of all the instalments payable, and to deduct from this total the net cash price at which the car could have been bought outright. The difference between the two sums is the total amount attributable to hire, and it should be then split up and spread over the number of years during which the agreement is current.

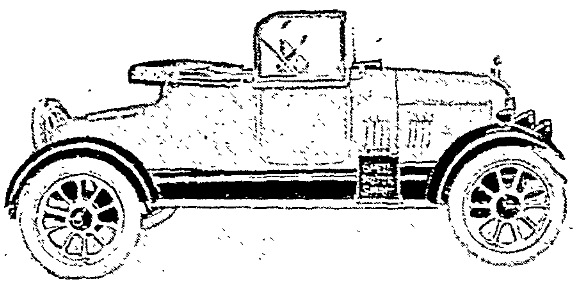
The annual amount thus ascertained *can be deducted* as a professional expense. Depreciation and a further deduction for repairs are also allowed, the amount being fixed by the income-tax authorities. The other portion of the instalments—i.e., those portions attributable to payment of the *purchase price*, are *not* allowed as a deduction from the profits.

The £200 Limit.

Motor Cycles.—The young energetic medical man may seriously consider the purchase of a good motor-cycle in place of a car. This is unlikely to be a wise investment, unless his work is carried on in a laboratory or an office and he requires a conveyance merely for purposes of recreation. For those in general practice the discomfort of a round in wet weather on a motor-cycle is intense, and, moreover, it is inadvisable to present oneself at a patient's house in mud-stained overalls. Again, even the most hardy nerves are likely to be upset in time by the excessive vibration which is experienced, and which one does not get on a car, however small.

Three-Wheel Type.—The three-wheel type of vehicle is becoming obsolete; from the point of view of a town practice it is entirely unsuitable owing to a difficulty in starting and a distinct tendency to skid. There would be no advantage gained by a purchase of this type of vehicle, as running costs can be considered practically equal to those of a small car. If existing garage arrangements will not permit of any other form of vehicle than the three-wheel, we would rather be inclined to extend the garage accommodation, if in any way possible, to take a small four-wheeler.

FIG. 1.



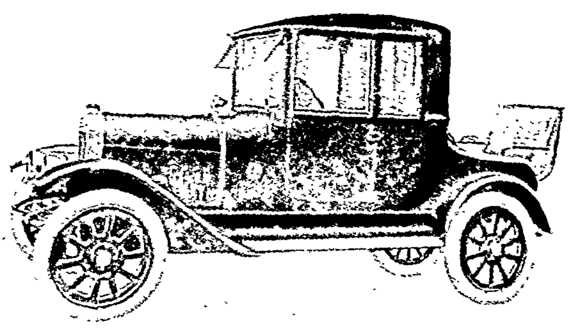
11·9 h.p. Morris-Cowley two-seater. Price £198. With side-curtains in use independently as side-screens.

The Small Car.—Some misconception is apparent amongst the average car buyers that because a small car may be cheap or low in price that it is necessarily no good. This is a complete fallacy. There are some small cars on the market which are perfectly reliable and will give good service to their owners for many years, always providing that due regard is given to the district in which they are likely to operate; for instance, it would not be good policy to purchase a 7 h.p. Austin, 7 h.p. Jowett, or 8 h.p. Rover for some of the wild and hilly moor practices in Yorkshire, although these would be perfectly suitable for the average town or country practice. A car suitable for the very rough, hilly country would be the Trojan or a Ford, although the latter is somewhat expensive in upkeep. At the same time it will give good service and stand a vast amount of rough usage. Among the sound cars obtainable for £200 or under are the Morris Cowley 11·9 h.p., the Clyno 11 h.p., and the Singer 10 h.p.

The £400 Limit; Higher-Priced Cars.

Cars between £200 and £400 are of a heavier type. Within reason, where an intending purchaser has the larger sum to spend, it is preferable to buy the better car for many reasons. It is more strongly built, the body-work is better, accessories more substantial, larger tyres are provided in relation to the horse-power. Grease gun lubrication, an essential point where too much time is not available for attending to the car, is also provided as a rule, and more power. The Calthorpe, 10 h.p. Calcott, 11.4 h.p. Citroën, Renault, Morris-Oxford, and 11 h.p. Standard are all sound examples of this type and may be relied upon to give good and efficient service for a number of years providing that ordinary care is given.

FIG. 2.



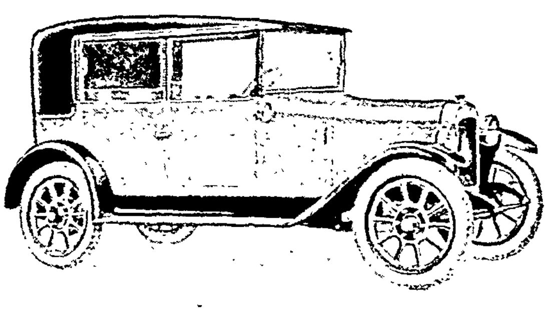
10–15 h.p. Calthorpe two-seater coupé. Price £350.

The choice of a car between £400 and £700 is not difficult. Such types as the 12 h.p. Austin, 14 h.p. Sunbeam, 14/40 h.p. Vauxhall, 15 h.p. Wolseley, 10/15 h.p. Fiat, 12 h.p. Rover, 14 h.p. Standard at once present themselves. Any of these can be confidently recommended, particularly on long-distance practices, or where a fairly large body is required for town use.

The Choice of Body.

The type of body preferred is largely a matter of individual taste. Generally speaking, for country work the best is a touring type (Fig. 1) with all-weather equipment. There are several excellent types on the market, and when completely closed the car is quite wind- and water-proof. For town work, some form of closed car is preferable—that is, a coupé (Fig. 2), all-weather (Fig. 3), or saloon (Fig. 4); this type of body adds slightly to the running cost, but not unduly so, owing to the fact that a comparatively slow pace has to be maintained in towns; it may safely be reckoned that town running costs at least 20 per cent. more than country. If a car is purchased with the all-weather type of body, it is essential that one should be selected with what is termed a steel head. Such a type is represented by the "Auster" or "Gwynne" head, in which practically no woodwork is used at all, and gives an extremely light body and the full effect of either an open touring car or the completely enclosed type. Providing this type is selected no trouble should be experienced with it for some years. But,

FIG. 3.



12 h.p. Austin "Harley" all-weather. Price £525.

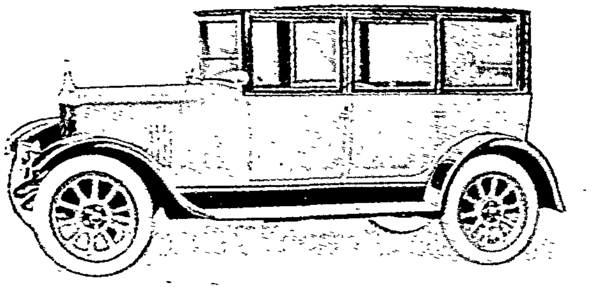
on the other hand, the disadvantages of the wooden pillar type cannot be too strongly emphasised.

Special Points about the Chassis.

Undersized tyres should be avoided at all costs for a number of reasons. If these are on the small side intense vibration will be felt throughout the car even on a fairly good road, and their life is short. An oversize should be fitted where roads are not good, or preferably, the new balloon type (Fig. 5), which on some makes of cars are fitted without extra cost. Much controversy has arisen over the question of these particular tyres, which are made by Dunlop, Michelin, and other well-known firms, but in my opinion the advantages outweigh the disadvantages, in that one gets freedom from vibration and slow rolling effect over very bad roads, with consequent reduction of undue strains on the chassis. On the other hand, there is a slight slowing of speed and steering is a little harder on sharp corners. In the course of a few months it will be possible to obtain replacements of these tyres in practically any town in the British Isles, so that no one need fear being stranded and unable to obtain a replacement. It may be taken as a general rule that cars are certainly not over-tyred, and practically any make will stand an oversize.

Frame.—Special attention should be paid to the frame of the chassis. This should be of generous dimensions, and for the novice can most easily be noticed by comparison. It should always be remembered that weight does not necessarily mean strength, and where a chassis is comparatively of very light construction the advice should be sought of a competent engineer or firm of repute. The Ford is quite a good example of a strong car of light construction. It is unwise to select a chassis with very low ground clearance—i.e., the distance from the lowest point of the chassis, which may either be the front axle or the bottom of the axle casing, should not be much less than 8 in. to 9 in., otherwise on rough roads or deep ruts damage may be done to the underparts of the chassis, involving heavy expenses in repairs.

FIG. 4.



14 h.p. Standard "Kensington" three-door saloon. Price £450.

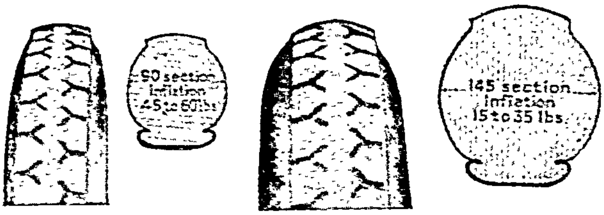
Accessibility of Parts.—General accessibility is essential, particularly in the case of the necessary greasers for various shackle pins on springs, brake-rocker, arms, &c., and the average up-to-date chassis is fitted with what is known as the Enots grease gun system (Fig. 6), which, by a turn of the wrist, can be fully charged without messiness.

Wheelbase.—Most cars have two wheelbases, the long and the short. The long is usually used for covered bodies, and the short for two or four seaters. There is little difference in the turning circle capabilities of either chassis on cars up to 15 h.p., but beyond that the long wheelbase has considerably extra weight, heavier running costs, and perhaps takes much wider space to turn in. Generally speaking, the long wheelbase chassis skids less than the short one.

Four Wheel Brakes.—These are a distinct advantage if they are or can be fitted to the particular model under consideration. They make for fast driving, and even on very greasy roads are quite safe. Cars can be pulled up at 40 miles per hour with all brakes on without a semblance of a skid.

Springs.—The only test of good springing is a ride in the car with the particular type of body that is being considered. What is termed hard springing can, of course, be considerably reduced by taking out one leaf from the back springs or fitting some form of rebound damper. These vary in price from a few shillings up to £15, according to the size of the car. They are quite effective and should invariably be fitted for bad or difficult country. Certain types of the cheaper priced cars are fitted with these as standard—for example, the Citroën.

FIG. 5.



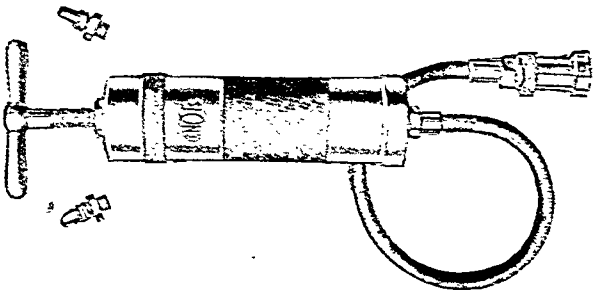
The ordinary tyre (left) made by the Associated Rubber Manufacturers, Ltd., compared with their balloon low-pressure tyre (right).

Transmission.—The accepted practice of to-day is to have fabric universal joints fitted in place of the older type of metal, and for several reasons: cheapness of replacement, absence of noise, no lubrication required, and increased flexibility when the drive is taken up, with consequent reduction of undue stresses on the engine and back axle.

Lighting and Starting Sets.

There are many types of lighting and starting sets now on the market which are simple and reliable, always providing that average attention is given them. It is essential that every doctor should have a self-starter fitted to his car. Modern self-starters are quite reliable, but they have one very vital point which the average owner gives small consideration to—that is, the battery. This is the essential part of the outfit since all current must come through it. It is also the most expensive part, and unless the plates inside are kept covered with acid or distilled water, buckled plates may result, which may cost anything from £4 to £12 to replace. If the dynamo of a modern car does not charge properly, it may be due to the slipping of the belt which drives it. If the dynamo is gear-driven and does not charge at low speeds, it should be shown to an expert. Formerly, in some small cars practically no current was generated at all at slow speeds, say at 12 miles per hour, but this may be considered a thing of the past. Whilst the car is running and the charging switch is on, the battery is being constantly filled, and when fully

FIG. 6.



Enots flexible grease gun. The smaller figures show connector valves, which replace the usual greasers.

charged the dynamo automatically cuts itself out, so that no damage can be done to the battery itself. In connexion with the efficiency of self-starters, I would point out that when starting an engine on a very cold morning it is quite useless to turn on the engine switch and press the starter button; 99 times out of 100 there is no result, and it will take about six to eight hours to make the current used during every minute that the starter button is pressed. An obvious duty the first thing in the morning is to make certain that all is ready for the electric current—that is, petrol turned on, petrol in the carburettor, air intake or inlet closed, throttle slightly open, and engine switch turned on. When these things are seen to the engine should be given two or three turns by hand before using the starter. If this is done no one need fear to go at any time in the night and find that he cannot get any light or power for starting through his accumulator having run down.

General Points for the Prospective Owner.

The cost of running a car is often exaggerated both ways; some say the expense of motoring is out of all reason, and others underestimate the cost, claiming excessively low petrol consumption and impossible life for their tyres. To arrive at a year's running cost is, of course, somewhat difficult, as luck enters into the cost to a certain degree. If the owner looks after and drives his own car, it depends largely on his knowledge of the car. If he knows sufficient and has time to carry out minor repairs, his bills will be considerably reduced. Garage is a heavy item, and difficult to obtain in towns for less than £25 to £30 per annum, and it is therefore advisable, if the necessary ground is attached to the house, for the owner to have a simple garage erected, which can be purchased from £15 upwards. In this way considerable saving can be effected after the first year.

Insurance is always advisable, owing to the danger of third party claims, and we strongly advise that a car should not be taken out until it is covered.

Registration is a heavy item, and at the present time there appears to be no hope of its being altered to a tax on petrol which; from the car-owners' point of view, would seem the most equitable method.

Chauffeurs.—If it is decided to keep a chauffeur, a careful selection will well repay the owner. It must not be considered that a chauffeur is essential. The amount of time taken to keep the outside of a car in good appearance depends to a surprising extent on its colour. Grey, for instance, requires little washing, showing little dust, and can be roughly washed, whereas blue will probably take three times the amount of work to keep it in the same condition. It has been wisely said that a doctor's car should not be blood-coloured, nor should it be shaped or painted like a hearse. If the type of lamps and equipment is studied—i.e., black plated instead of nickel—this will reduce the work to practically nil. With ordinary care and attention few repairs should be required for thousands of miles. Small adjustments can be made by the owner himself if he has studied the many excellent handbooks which are issued with each car and should present no difficulty to the average owner. In cases of electrical difficulty, it is always advisable to call in a competent firm. Many chauffeurs, of course, take the utmost pride in, and care of, cars in their charge. A good man who knows his work can save his employer many pounds per annum by doing the running adjustments or small repairs that crop up from time to time. Their wages vary very considerably in different parts of the country so that no standard figure is suggested. Giving full power to chauffeurs to order spares, &c., is not advisable as this tends to make them careless.

Second-hand Cars.—This is a difficult matter for a prospective owner to tackle, whether he be a novice or experienced motorist. It may be taken that it is a highly specialised branch, and he should place himself in the hands of a reputable firm who will advise and report on the actual car both as to price and mechanical condition.

It is difficult to deal with the many small details which crop up in connexion with the purchase of a car. If the wrong type is chosen it will lead to much disappointment and expense to the unfortunate owner. It is advisable to seek the help of a specialist who can be relied on to give unbiased advice.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Suicide Statistics.

ACCORDING to the statistical records of the Berlin police 267 cases of suicide have been registered in the first quarter of this year, the figures for the corresponding period in the last nine years being as follows: in 1915, 90; in 1916, 111; in 1917, 127; in 1918, 129; in 1919, 97; in 1920, 141; in 1921, 191; in 1922, 186; in 1923, 256. It will be seen that with the exception of 1919, the first year when there was some hope for a better future after the end of the war, the number of suicides has maintained an increase and is now nearly three times greater than in 1915. The methods of suicide have undergone certain changes in the course of time. Formerly poisoning with corrosive sublimate, with carbolic acid, lysoform, or arsenic was preferred, but the strict regulations on the sale of drugs made it more difficult to purchase such poisons, so that other means were adopted. In the majority of cases the act was committed by hanging or poisoning by gas, but many shot themselves. On the other hand, all women suicides had recourse to drowning. Poisoning by drugs has become very rare; during the first quarter of this year in six cases only was veronal, morphia, or arsenic used. The chief causes to which the suicides were ascribed were: financial ruin, incurable disease, unhappy love affairs, and melancholy. All classes of society furnish their quota, but domestic servants and workmen are in the majority.

A New Medical Society for Sports.

The interest shown in sports by a large party of the medical profession has led to the suggestion of forming a medical society for sports—not a society of medical footballers, cricketers, or tennis-players, but an association for the study of hygienic and physiological questions connected with sports. The formation of the society is backed by the large sporting and gymnastic clubs who wish to be advised as to methods of training from a medical standpoint and to have their members under medical control. Among the initiators of the scheme are several well-known professors of Berlin University, including Dr. Bier, professor of surgery, Dr. Kraus, professor of clinical medicine, Dr. Rubner, professor of hygiene, and Prof. Hueppe, formerly of Prague. A meeting has been called at which it is hoped to found the new society.

Nervousness in Children.

The German Society for School Hygiene at their annual meeting held this year in Hamburg discussed nervousness in school-children. The President, Prof. Czerny, of Berlin, stated that congenital neuropathy was not more frequent now than formerly, the increase of neurasthenia being due to external causes of which the influence of the school played a large part. Dr. Flachs, of Dresden, explained that neuropathic school-children could be divided into four types: the timid, the excited, the shy, and the apathetic. School medical officers often discover that an alleged neurasthenia is only a symptom of an organic trouble, such as epilepsy or rickets. He deprecated the exaggerated tenderness of mothers who question the children constantly on subjective symptoms, take the temperature without reason, and so spoil the child's character. "But," added Dr. Flachs, "children suffer from the bad financial condition of the parents. Sometimes they sleep too little because they must help to work. Again, the parents indulge in amusements and take the children with them. Visits to cinemas are particularly bad for children, because of the flickering and dazzle of the picture. The noise of street traffic is also very injurious. Sports are the best means of hardening the child and of strengthening its self-confidence." An argument for the Medical Society for Sports is thus furnished.

Overcrowding in the Medical Profession.

The Leipziger Verband has recently issued a further urgent warning[1] against the study of medicine, because of the overcrowding of the medical profession. They state that one of the reasons of overcrowding is that the army and navy medical corps respectively have been almost totally disbanded and consequently many members have entered civil practice and have obtained State medical appointments which were formerly the privilege of civil doctors. Another reason is that owing to the loss of the colonies and other parts of German territories many medical men from these parts have settled in the remainder of Germany. Also, the older medical men who in former times would have retired from practice at a certain age are now, through bad financial conditions, compelled to practise as long as their health permits or even until death. The Verband reminds intending medical students of the difficulties of club practice since the free choice system is in danger, so that possibly in future only a portion of the profession will have the opportunity of practising under the insurance laws. The Verband states that for many years there will be no vacancy for assistantships in hospitals and university clinics. Stress is also laid on the fact that the training of medical students is of longer duration and thus more expensive than that for other academical profession. The former warnings have already had the effect of causing a decrease in the number of medical students, but the supply still exceeds the demand. According to the *Münchener Medizinische Wochenschrift*, the number of medical students in Germany during the winter session, 1923–24, was as follows: Berlin, 1967; Munich, 1394; Leipzig, 750; Würzburg, 640; Freiburg, 588; Breslau, 572; Heidelberg, 555; Jena, 517; Bonn, 506; Kiel, 402; Marburg, 353; Frankfurt, 337; Halle, 329; Tübingen, 308; Göttingen, 307; Königsberg, 295; Greifswald, 256; Rostock, 250; Hamburg, 239; Giessen, 226; Erlangen, 209; Cologne, 168; Münster, 167. Total, 11,335.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Gastroscopy.

GASTROSCOPY has been comparatively little studied in France, and the only systematic research that was carried out by this method was done by Moure. But it is interesting to note that when Kussmal in 1886 introduced a rigid tube into the stomach for the first time he employed an endoscope which had been purchased in Paris. Since that period a great number of instruments have been invented, the best known being those of Elsner, Schindler, and Sternberg. Dr. Benschulde, physician to the hospital of St. Antoine, recently demonstrated before the Academy of Medicine a new gastroscope which he invented and which obviates some of the defects of earlier instruments. It consists of three parts: First, a tube containing the optical apparatus; secondly, a head piece, which carries a lamp and which is furnished with a guiding cannula; thirdly, a strip of steel terminating in a metal ball. In the first place the metal strip, which acts as a guiding thread, is introduced and then the gastroscope itself is slid over this strip, which passes through the cannula in the head piece. Examination is carried out in the knee-elbow position. This position has the advantage of enabling liquids to flow away from the mouth, bringing the stomach to the eye of the observer, and of freeing the cardiac end. In this position the liver falls forward against the abdominal wall and separates it from the stomach and the loops of the intestine. The view which can be obtained by the gastroscope is so clear that the greatest hope can be placed in the future of gastric endoscopy. This method, in spite of difficulties in locating points in the stomach, is one which can be of great service in the early diagnosis of cancer ulcer, rare tumours, and in certain forms of gastritis.

A Medical Club.

There are in Paris many clubs for professional and military men, but doctors possess no building where they can meet and discuss medical matters. For more than 50 years there has been a question of forming such a club, but several tentative efforts to found one have come to naught. The Association Générale de Médecins de France has taken up the idea again and has formed a committee to look into the matter. As the result of a conference held two years ago by Dr. Charles Levassort in the large theatre of the Faculty of Medicine, Dr. H. Forestier of Aix les Bains gave an account of similar organisations which existed in Copenhagen, in Stockholm, and in London, which made us regret all the more that we had no such institution. At the moment it seems as if the scheme might come to fruition. Dr. A. Thiery, president of the study committee, has made an appeal to the French Medical Corps, with the object of acquiring the old house of the University des Annales in the Place Saint Georges, which is at present vacant. It is a very fine building with a large entrance hall and many large rooms, of which one could be used as a demonstration theatre to seat 600 people. The other rooms could be used as reception rooms, lecture rooms, writing rooms, &c., or as the headquarters of various scientific and professional societies. In this way a central club might be formed, and on the premises a permanent exhibition might be held of the products of medical commercial houses. The addition of a restaurant would make the club a pleasant place in which Parisian doctors might entertain their colleagues from the provinces.

Social Aid for Abnormal Children.

The Society of Pediatrics recently held a long discussion on the question of social help for abnormal children. It was decided that the instruction of these children should not merely be optional, but ought to be enforced by law. In order to carry this into effect, it would be necessary to institute supplementary classes and to extend the system of boarding out weak-minded children who showed no moral perversity. The system would be worked from organised centres, and the children would be under the care of a doctor and a visiting nurse. It was suggested that in hospitals for children a neuro-psychiatric clinic ought to be established, the clinic to be conducted by specialists with the object of diagnosing and treating and placing abnormal children. The staff should further include a lady visitor. This department would be attached to the hospital, and would have at its disposal a certain number of beds for observation and necessary treatment. It should also work in close association with educational and boarding-out establishments, asylums, and private homes, &c.

Treatment of Delinquents in the Penal Code.

The recent congress of forensic medicine, which was held in Paris, requested the French Penal administration to institute in the Penal Code such changes as would be necessary for the physical and moral treatment and social re-education of prisoners. The congress passed a resolution in favour of developing by all possible means psychiatric and mental prophylaxis and hygiene.

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[1] THE LANCET, March 29th, 1924, 672.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal statistics for 1923 of two county boroughs and two boroughs, the annual health reports of which we have received :—

Name of borough.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population. All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Death-rates per 1000 births. Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Croydon C.B. ..	193,400	17·4	10·4	1·0	1·3	1·7	22	52	3·0
Southport C.B.	72,410	13·8	13·5	0·9	1·3	2·6	34	65	2·0
Swindon B. ..	55,980	17·8	9·3	1·2	1·2	1·2	32	52	0·0
Taunton B. ..	24,500	15·6	10·5	1·1	1·2	1·6	26	57	2·6

Croydon.

Dr. H. P. Newsholme compares the distribution of families at the 1921 census with that in 1911. The size of the family in 1911 was 4·28, in 1921 4·03. In 1921 19·2 per cent. of the families lived in one, two, or three rooms, as against 15·8 in 1911. The percentage of persons living in more than two to a room was 4·7 in 1921 and 4·3 in 1911. As regards constitution of the population there is at the last census a lower proportion of children under 15 owing to the declining birth-rate and a higher proportion of persons over 45, owing to the decreasing death-rate. The borough sanatorium, Cheam, is to be enlarged from 50 to 85 beds (40 for Croydon, 40 for Surrey county, and 5 for Kent county) and to be used mainly for the treatment of medium and advanced cases of pulmonary tuberculosis. The establishment of an open-air school would free beds in other institutions at present used for glandular, &c., tuberculosis for the more urgent needs of children suffering from surgical tuberculosis. Sixteen shelters are in regular use. After-care work is the least developed side of the tuberculosis scheme.

An analysis is given of the variations in infant and child mortality during 1901–21. Infant mortality has decreased to 62 per cent. of the rate of 1901–05, child mortality at the age-period 1–5 years to 66 per cent., but the mortality at the period of 5 to 15 years has remained practically constant, possibly because during this healthy period it approaches the minimum attainable. During infancy there has been no notable decrease in the fatality of bronchitis, pneumonia, premature birth, atrophy, debility, and marasmus. During early childhood there has been no notable improvement in the mortality from bronchitis, pneumonia, and measles. Midwives attend about 50 per cent. of the births, and in 1923 sent for medical help in rather less than 10 per cent. of their cases. The corporation retain 15 beds in St. Mary's (Lying-in) Hostel conducted by the Croydon Mothers' and Infants' Welfare Association, in return for an annual subsidy of £1800. Towards the end of the year it was decided to test the following allocation of the 17 beds at the hostel: 11 for normal cases, 3 for complications, 2 for emergencies, and 1 bed for isolation. Abnormal cases are attended by a rota of practitioners, each pair on duty for a week at a time, one on "first call" and the other on "second call." The usual fee paid by the Association to the practitioner is £2 per case. Arrangements are made for the six or seven pupil midwives in training at the hostel to spend the last month of their course with a Croydon midwife, with a view to gaining experience of district work. The V.D. clinic is being more used and appreciated by women patients. There is scope for more educational work in Croydon, says Dr. Newsholme, with regard to these diseases. Croydon has its housing difficulties. "It is the rule rather than the exception for the poorer class of house to be occupied by two or more families." The new houses erected during 1923 numbered 963, mostly villas for sale on completion. No municipal or other houses were completed with State assistance during 1923, but 533 houses were approved for subsidy during 1923 and up to April, 1924.

In his report as school medical officer Dr. Newsholme mentions his proposal for a rearrangement of nursing districts, by which each health visitor or nurse will be responsible for all varieties of public health nursing work within her area, including school nursing, home visiting, and centre work in connexion with maternity and child welfare, and tuberculosis visiting. Dental treatment is very incomplete at present. Only the 6–7 year-old group are inspected and of these not half accept treatment, and there is no arrangement for reinspection after 7 years of age. Dr. Newsholme submits an important scheme for extension, which involves an increase in expenditure from £700 in 1923 to about £2000 in 1926, a progressive increase in the dental staff (at present three part-time dentists conduct eight sessions weekly) to two whole-time dentists, and a corresponding increase in the nursing and clerical staff, the fuller use of the present dental clinic, and the provision, later on, of a second dental clinic, &c. By these provisions annual reinspection will be extended year by year; in due course, dental inspection will be begun at 5 years; and treatment facilities will be provided for mothers and children under 5. At the same time steps will be taken to educate the parents as to the urgency of the need for dental treatment.

A remarkably large number of cases of spinal curvature were found during routine medical inspection; 144 cases, or 2 per cent., of the children seen were referred for treatment. This prevalence was associated in some instances with the use of obsolete desks, and arrangements have been made for their steady replacement by desks of a modern type. Miss May Appleton, the organiser of physical training for girls, submits an interesting report on her work. Dr. Newsholme would welcome a similar appointment for the organisation of physical training for the boys.

Southport.

Dr. George C. Barnes appeals to the medical profession for a more careful observance of the provisions of the various Acts requiring notification. A number of births and cases of pneumonia escape notification, and about 60 per cent. of the cases of pulmonary tuberculosis are only notified in stage 3. Of the institutions subsidised by the corporation, the All Saints' creche has been closed on account of falling attendance, and the Southport Babies' Home is said to be not altogether suitable for its purpose. In the case of the latter, Dr. Barnes discusses "boarding-out" as an alternative, but thinks it would be difficult to get foster-mothers for infants. We believe, however, that the United Services Fund (Secretary, 29, Cromwell-road, S.W. 7) is able, by a system of careful selection of foster-mothers and adequate payments, to board out children of all ages successfully in country villages.

Swindon.

Dr. Dunstan Brewer reports that Swindon was exceptional in not having to face conditions of severe poverty and unemployment during 1923. The reconstruction of the sewage works is nearing completion. The first section of the storm-water scheme is almost completed, and the whole system designed to relieve the flooding of the lower part of the town will be finished ere long. The work of the storm-water scheme has abolished the long-standing nuisance caused by the canal. The nuisances caused by the condition of the public conveniences still remain to be tackled. The water shortage of the northern part of the town has been relieved by the new water main, completed in 1923. The house shortage is still acute, and "until houses in comparatively large numbers which can be *rented* are available the problem of overcrowding in Swindon is insoluble." Throughout his report Dr. Brewer continually refers to the lack of general hospital accommodation commensurate with the needs of the town, and in his conclusion he gives this and the artificial feeding of infants as the two outstanding obstacles to public health progress.

Taunton.

Dr. John Allen says, "The lack of houses of any kind is the most serious defect affecting the health of the people, while at least 700 of those in occupation are without ventilation and are quite unfit for use as dwelling-houses." Nevertheless "Health Week" was observed very actively by means of lectures, sermons, &c., and the mayor gave a prize for the best essay by an elementary school-child on "What I must do to keep healthy and fit." Dr. Allen includes in his report extracts from the Ministry's circular on cancer. In September the infant welfare centre was moved into much more convenient premises. Various brands of dried milk are stocked at the centre and sold to the mothers at cost price. Dr. Allen's opinion on its value is no uncertain one. He says, dried milk "is infinitely cleaner and has a more stable cream content than ordinary milk, and is more than equivalent to certified milk." The hours of sunshine in Taunton during 1923 were 1508·5.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 21st, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 58; scarlet fever, 1348; diphtheria, 651; enteric fever, 133 (as against 83 of the previous week); pneumonia, 708 (as against 588 of the previous week); puerperal fever, 34; cerebro-spinal fever, 9; acute poliomyelitis, 6; acute polio-encephalitis, 1; encephalitis lethargica, 161 (as against 171 of the previous week); dysentery, 6; ophthalmia neonatorum, 144 (as against 122 of the previous week). There were no cases of cholera, plague, or typhus fever notified during the week. Of the 58 cases of small-pox, 28 were notified from the county of Derby (Derby 4, Chesterfield 14, Swadlincote District 5, Chesterfield R.D. 3); 7 from Northumberland (Ashington); 6 from the county of Nottingham (Nottingham, 1, Stapleford 2); and 16 from the North Riding of Yorkshire (Middlesbrough 15). Of the cases of encephalitis lethargica 25 were reported from the county of London (Battersea 1, Bermondsey 1. Camberwell 1, Chelsea 1, Deptford 6, Finsbury 1, Hackney 1, Islington 2, Kensington 1, Lambeth 1, Poplar 1, St. Pancras 1, Shoreditch 1, Southwark 2, Stepney 3, Westminster, 1); 9 from the county of Durham (Sunderland 4, and Sunderland, R.D. 1); 5 from Essex (Walthamstow 4); 8 from the county of Gloucester (Bristol 5); 4 from Kent (Rochester 2), 22 from Lancashire (Blackburn 4, Liverpool 3, Manchester 5, Warrington 2, Accrington 2); 9 from Middlesex (Heston and Isleworth 2, Tottenham 3); 4 from Northumberland (Newcastle 3); 5 from the county of Stafford; 15 from the county of Warwick (Birmingham 9); and 12 from the West Riding of Yorks (Bradford 2, Sheffield 7).

Deaths.—In the aggregate of great towns, the deaths from influenza remained at 25, the figure for last week. The deaths from diphtheria in London fell from 14 to 8 and increased from 27 to 29 in the great towns.

HARTLEY HOSPITAL, COLNE.—This hospital, the gift of the late Sir William Hartley, of Southport, was opened on June 21st by the daughter of the donor. The total cost is estimated at £100,000. Gifts amounting to £10,000 towards the establishment of an endowment fund have been collected.

MEMORIAL TO THE LATE SIR FRANCIS FARMER.—On June 25th Mr. Asquith unveiled, at the London Hospital Medical College, a memorial to the late Sir Francis Farmer, L.D.S. R.C.S., who at the time of his death was consulting dental surgeon to the London Hospital. After paying for the tablet some £570 remain in hand from the subscriptions collected, and it is intended to use the money to establish an endowment scholarship, which will bear Sir Francis Farmer's name.

Correspondence.

"Audi alteram partem."

VOMITING AS A PATHOLOGICAL FORCE.

To the Editor of THE LANCET.

SIR,—The interesting paper by Dr. de Wesselow on the Inorganic Constituents of the Blood, which appeared in THE LANCET of May 31st (p. 1099), contains statements further supporting the view that vomiting is a pathological force. All the world recognises that vomiting at times is beneficial. Vomiting after feasts, from ancient times, has been practised—a distinguished surgeon, but a few years deceased, after attending banquets, as a routine used the stomach-tube. By unloading the overladen stomach we relieve not only that organ, but all the digestive and assimilative apparatus of a work which is excessive and causes a strain on the organs concerned, and which therefore, if too frequent in occurrence, is deleterious. And "that the vomiting of uræmia may be regarded as constituting a protective mechanism" may be admitted. It rids the body of poisons, of toxins—i.e., of natural waste products (however so changed)—it acts just in the same way as the vomiting incidental to the ingestion of such a poison, for instance, as arsenic.

Whilst this is recognised, it is not yet known that vomiting, if persistent and coercive—and quite apart from the resulting relative starvation and dehydration—has pernicious effects. I cite such states as sea-sickness, the vomiting of pregnancy, of intestinal obstruction, of uræmia. Dr. de Wesselow, under his "Table III.—Nephritis," comprising ten cases, includes one of intestinal obstruction. Referring to this case, he says: "Early in the course of obstruction, the chloride is noticeably low and the bicarbonate somewhat above the normal level; the urea retention present in this patient is a constant feature of the severer types of obstruction, and is apparently the result of definite renal damage." He then goes on to consider the findings in a case of nephritis, in which observations at four successive times were made. He says: "In Case 3, vomiting ceased shortly after the second blood sample was examined, and at the time of the third observation (28 days after the second), a more normal distribution of the acid radicles of the plasma was present. The bicarbonate was now reduced in proportion to the phosphate accumulation, and the plasma chlorides had returned to a normal level. The cessation of vomiting was accompanied by an extremely rapid gain in weight, which may have represented the restoration of the chloride and water content of the body to a normal figure, since the water content is largely determined by the amount of chlorides present in the organism."

Thus, Dr. de Wesselow, if I understand him aright, believes that by the vomiting much chloride (as HCl) is lost; and that with cessation of the vomiting this loss ceases so that the tissue cells again take up water with an increase of weight. But vomiting has not only a chemical effect; it not only rids the body of the contents of the stomach and thus affects the blood, the tissue fluids, and presumably the tissue cells: it has a mechanical effect. By vomiting, not only is the stomach compressed, but also the other abdominal organs; the liver and kidneys, with the stomach, are the subject of an impaction, or of a series of impactions—i.e., of a compression, or of a series of compressions—suddenly arising and of considerable degree. It cannot be believed that such impactions can occur without staying even for the moment the blood flow through the organs, nor can it be believed that the frequent repetition of such act is without effect on these organs, and consequently without effect on the blood. The vomiting associated with arsenical poisoning, with intestinal obstruction, with pregnancy, and we may add with sea-sickness, all result in damage to the liver and kidneys. It has been supposed that the impairment of the kidney in intestinal obstruction is due to a toxin absorbed from the obstructed gut. I have shown[1]—and according to one or two reviewers have made out a good case for my view—that the toxæmia of intestinal obstruction is not due to such a toxin, but to the effect of the persistent vomiting. We have only to consider the structure of the vascular system in the kidney and the dynamics of the blood-flow through this organ to see that undue compression of the organ must militate against its normal manner of functioning, and even to produce pathological changes. The cessation of the vomiting not only prevents further loss of water and of chlorides, it allows the blood-flow through the kidney (and through the liver) to continue undisturbed; and if the reparative powers of these viscera are normal, to cause a return to the normal state. A rapid gain in weight under such conditions is not surprising; to attribute it simply to a retention of chlorides and water is admittedly an assumption. Such conception takes no account of the relationship of the kidney function with protein—muscular—metabolism. It leaves aside altogether the question of the internal secretion of the kidney—thought by some to affect the musculature and thus to be related to body-weight—and which we may with reason suppose suffers when the other functions of the organ have bcome impaired. In short, a very important effect on the body of vomiting has been unconsidered, and until this question is settled progress cannot be made. I have urged before that man consists of so many pounds avoirdupois; that many of his vital acts are mechanically controlled. Man, in short, is a machine, in which the chemical reactions, as elsewhere in the universe, are subservient to physical conditions. To shut our eyes to the physical effects of vomiting on the body, and to see only in this act a chemical change, is to miss an essential point. It is clear the blood-flow through the viscera must be considered, and the effects of acts such as vomiting on this be determined.

I am, Sir, yours faithfully,

Rugby, June 15th, 1924. R. H. Paramore.

THE SCHICK TEST.

To the Editor of The Lancet.

Sir,—May I comment on a few points in the valuable record of observations on the Schick test by Dr. C. B. Ker and Dr. J. McGarrity in your issue of May 31st. We agree with what Dr. Ker finds—i.e., that a "positive and pseudo" reactor can be immunised successfully so that he later becomes a "negative and pseudo" reactor. The mistake referred to in Dr. Ker's letter of June 28th has probably arisen from my careless use of the clumsy terms relating to these two classes of people. In laboratory jargon we speak of a "negative and pseudo" reactor as a "pseudo" reactor, and I have probably unintentionally misled Dr. Ker as to our opinion by saying that a "pseudo" reactor (meaning a "negative and pseudo" reactor) is immune and does not need prophylactic.

The authors quote laboratory work as showing that all antitoxin may have disappeared from the blood in 12 days. I should think this is an unusually short period, though we have recently obtained a clear positive Schick reaction in an adult who received a dose (probably 500 units) of antitoxin 14 days previously. We are at present engaged in examining the blood from a number of patients at various intervals after receipt of diphtheria antitoxin, and we find that the majority of these patients have a small but detectable amount of antitoxin in their blood four to five weeks after the injection of antitoxin. Most of these patients retained so little antitoxin that they would probably have given a positive Schick reaction. We think the laboratory evidence agrees with what Dr. Ker finds from his wide clinical experience—i.e., that a dose of antitoxin gives protection for three weeks. It would be interesting to know whether the nurse who gave a slight reaction on both arms and after being classed as negative developed diphtheria, had a severe or mild attack. We have records of three patients in four years' work who had certainly given a Schick negative reaction, and later on suffered from a sore-throat and yielded virulent K.L.B. in culture. All three patients showed very slight symptoms, and may justifiably be classed with what Dr. Harries calls "a transient tonsillitis associated with the presence of morphological diphtheria bacilli."

Dr. Ker and Dr. McGarrity did not find the reading at 24 hours accurate in a very high percentage of instances. The delay in the appearance of the reaction amongst their patients may be connected with the ill-health of the children. My colleague, Mr. Glenny, finds that in ill- or badly-nourished guinea-pigs the reactions are reduced in intensity and may be delayed. The children quoted in our papers were almost all healthy children, inmates of schools or institutions. We have not had many opportunities recently of making 24-hour readings on large numbers of children, but our evidence in the past year or two confirms the expectation derived from our earlier work that approximately 95 per cent. of *healthy* children will give over-night reactions that agree with later readings.

In view of Dr. Ker's experience, it is evident that further attention must be given to this important point in the future.

I am, Sir, yours faithfully,

R. A. O'Brien.

Wellcome Physiological Research Laboratories,
Beckenham, June 30th, 1924.

THE FORBES FRASER MEMORIAL FUND.

To the Editor of The Lancet.

Sir,—In view of the generally expressed wish that there should be some lasting memorial to the life and work of the late Mr. Forbes Fraser, a small committee, with the Mayor of Bath as chairman, has been formed to consider how best to give effect to this widespread desire. The medical men on the committee include Dr. C. E. S. Flemming, Dr. F. G. Thomson, and Mr. W. G. Mumford. It is felt by the committee that whatever form the memorial takes it should be in some way connected with the recently opened hospital at Combe Park, the inception of which was mainly due to Mr. Forbes Fraser. Not only did the idea originate with him, but it was largely owing to his stimulating influence and untiring energy that the difficulties connected with the building and equipment of the hospital have eventually been overcome. In order to commemorate his work, the hospital committee have decided that the institution shall in future be known as the Forbes Fraser Hospital.

Owing to the limited funds available, it has been found impossible to provide the Forbes Fraser Hospital with certain very necessary equipment. One of the most pressing needs is the provision of a thoroughly well equipped X ray department. Mr. Fraser was himself urgently impressed with this need, and at the time of his illness was actually considering plans for its provision. It is felt by the committee that no fitter memorial to his memory could be devised than to provide the funds necessary to instal this department.

The total cost of the erection and equipment of an X ray department is estimated at from £2500 to £3000; donations may be sent to Mrs. A. L. Hope, Eagle House, Bathford, Somerset, or may be paid direct to the Forbes Fraser Memorial Fund, National Provincial Bank, High-street, Bath.

I am, Sir, yours faithfully,

A. L. Hope,
Hon. Secretary and Treasurer, Forbes Fraser Memorial Fund.

June 28th, 1924.

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[1] The Toxæmia of Acute Intestinal Obstruction; or Vomiting as a Pathological Force. London: H. K. Lewis and Co. 1923.

SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—Mr. Holroyd [illegible] in his paper on this subject in THE LANCET of June 21st, says with regard to disadvantages of this method of anæsthesia, "I know of none, provided the technique be correct, save the slight extra work which devolves on the surgeon." May I remind him of a complication which certainly is not common, but which I happen to have seen twice lately, and that is paralysis of one or other sixth cranial nerve. It is by no means a trivial complication, and the resulting diplopia is most confusing and distressing to the patient.

I am, Sir, yours faithfully,
R. FOSTER MOORE.
Harley-street, W., July 1st, 1924.

OSTEOPATHY IN ITS MEDICO-LEGAL ASPECTS: A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—In your report in THE LANCET of June 28th of the meeting of the Medico-Legal Society, at which Dr. Norman J. Macdonald read a paper on this subject, I am credited with certain remarks in the subsequent discussion of the paper. As a matter of fact, though I am a member of the Medico-Legal Society, I was not present at this particular meeting. As the remarks attributed to me by no means represent my views on the subject, I should be much obliged if you would publish this letter, disclaiming them.

I am, Sir, yours faithfully,
ARTHUR S. MORLEY.
Gordon-square, W.C., June 27th, 1924.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

To be Surg. Lts.: J. H. Laydon, J. J. O'Reilly, and J. J. A. O'Sullivan.

ROYAL NAVAL VOLUNTEER RESERVE.

T. W. Drummond, late Temp. Surg. Lt. R.N., to be Surg. Lt. R.N.V.R.

ROYAL ARMY MEDICAL CORPS.

Temp. Capts. H. H. Crickitt and R. B. Hunt (on account of ill-health) relinquish their commns. and retain the rank of Capt.

MILITIA.

Capt. A. E. B. Paul relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. I. M. Pirrie (late R.A.M.C., Militia) to be Capt.

ROYAL AIR FORCE.

Flying Officer V. S. Ewing is promoted to the rank of Flight Lt.

DONATIONS AND BEQUESTS.—Following on the death of Mrs. Mellor the trustees under the will of the late Colonel John James Mellor, of Manchester, who was Member of Parliament for the Radcliffe-cum-Farnworth Division, have made a partial distribution of his charitable bequests, including £1000 each to the Manchester Royal Infirmary, Bury Infirmary, Christie Cancer Hospital, St. Mary's Hospitals for Women and Children, Manchester, and the Children's Hospital, Pendlebury, Manchester, to endow a "Mellor" bed in each institution; also £2500 to found a Mellor Nursing Fund for the provision of a nurse for Whitefield; £1000 to the existing Mellor Convalescent Fund; £1000 for Lytham Cottage Hospital; and £500 to the Manchester and District Surgical Aid Society.—The late Mr. Frederick William Smith, of Ramsgate, left by will £500 to the General Hospital, Monmouth, for a bed to be known as the "Maria Smith Bed," in memory of his mother. Part of the residue of the property he left to the Seamen's Infirmary, Ramsgate, on the death of his wife.

Medical News.

UNIVERSITY OF GLASGOW.—At the graduation ceremony on June [illegible], degrees were conferred as follows:—

Hon. LL.D.—Sir Malcolm Watson, Senior [illegible], Federated Malay States Medical Service.

M.D. (with Honours).—David Campbell, M.A., B.Sc., M.B., Ch.B. (Thesis: Studies on the Rheumatic [illegible] and its Treatment, with special reference to the use of Non-specific [illegible]); [illegible] Gillespie, M.B., Ch.B. (Thesis: The [illegible] Basis of Clinical Tests of Cardiac Efficiency).—*In Absentia.*

D.Sc.—James H. [illegible], M.A., B.Sc., M.B., Ch.B. (Thesis: Studies in Special [illegible] Physiology.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—As the result of the Primary Fellowship Examination held from June [illegible] to [illegible], for which [illegible] candidates presented themselves, [illegible] were approved and [illegible] were rejected. The successful candidates were as follows:—

J. L. [illegible], Liverpool; [illegible]; [illegible], Cambridge and St. Bart.'s; G. M. J. [illegible], Otago and Middlesex; F. G. [illegible], Cambridge and Middlesex; [illegible] and A. [illegible], St. Thomas's; F. L. [illegible], King's Coll. and St. Mary's; H. J. [illegible], Cambridge and St. Bart.'s; J. E. [illegible], St. Bart.'s; J. L. [illegible], Melbourne and Middlesex; S. W. [illegible], Manchester; [illegible], Oxford and St. Thomas's; [illegible], Manchester and St. Mary's; R. A. [illegible], Middlesex; W. A. Gray, Edinburgh and St. Mary's; P. [illegible], Guy's; [illegible], Sydney and Middlesex; R. P. S. [illegible], Otago; [illegible] Lloyd, Guy's; E. E. Mackay, Melbourne and Middlesex; J. McMichael, Edinburgh and St. Bart.'s; [illegible], Edinburgh and St. Mary's; F. W. G. [illegible], Middlesex; C. H. Osborn, Melbourne and Middlesex; C. L. [illegible], Cambridge; A. M. Reid, Liverpool and Middlesex; J. Roberts, Liverpool; M. P. [illegible], Sydney and Middlesex; S. N. Taylor, Manchester and St. Mary's; and C. L. [illegible], St. Mary's and Middlesex.

ROYAL COLLEGE OF SURGEONS IN IRELAND: *Election of Examiners.*—At a meeting held on June [illegible], Mr. Robert C. B. Maunsell, President, in the chair, the following were elected as examiners for the ensuing year:—

Court "A" (Conjoint Licence, Diploma in Public Health, and Preliminary).—Anatomy: Prof. E. J. Evatt. Surgery: Mr. L. G. Gunn and Prof. G. J. Johnston. Physiology and Histology: Prof. J. A. Scott. Pathology and Bacteriology: Prof. W. Boxwell. Midwifery and Gynæcology: [illegible] E. H. Tweedy. Biology: Prof. [illegible]. Ophthalmology: F. C. Crawley and R. D. Joyce. Chemistry and Physics: Prof. W. Caldwell. Chemistry and Physics, for Diploma in Public Health only: Prof. W. Caldwell and Dr. S. Young. Materia Medica, Pharmacy, and Therapeutics: Prof. R. J. Rowlette. Forensic Medicine and Public Health: Prof. V. M. Synge.

Court "B" (Fellowship, Licence in Dental Surgery).—Anatomy: Prof. E. J. Evatt and Dr. C. M. West. Surgery: Mr. [illegible] Chance, Mr. L. G. Gunn, Prof. G. J. Johnston, and Mr. H. Stokes. Physiology and Histology: Prof. [illegible] and Prof. J. A. Scott. Pathology and Bacteriology: Prof. W. Boxwell and Prof. R. J. Rowlette. Chemistry and Physics: Prof. W. Caldwell and Dr. S. Young. Dental Surgery and Pathology: Mr. G. Sheppard and Mr. [illegible] Doolin. Mechanical Dentistry: Mr. [illegible] and Mr. J. Cockburn.

AUGUSTUS AND ALICE WALLER MEMORIAL.—A meeting of subscribers to the fund which has been raised in memory of the late Dr. and Mrs. Augustus D. Waller is to be held at the London (R.F.H.) School of Medicine for Women, on Thursday, July 17th, at 5 P.M. Sir Edward Sharpey Schafer will preside. In inviting contributions the organising committee stated that the Memorial should take the form of a fund for the encouragement of [illegible] Research to be administered by the Council of the London (R.F.H.) School of Medicine for Women, and the final arrangements concerning the Memorial will be decided at the meeting. Intending subscribers [illegible] subscriptions to the Hon. Treasurer, [illegible], St. Thomas's Hospital Medical School, [illegible] possible. £1820 have been subscribed, and [illegible] the total of £2000 will be reached.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on June [illegible], [illegible] Professor of [illegible] University College, [illegible] was adopted. [illegible] in the University was [illegible] in respect of his appointment [illegible] Surgical Unit at University College Hospital Medical School. The title of Professor of Physics kidneys. It has been supposed that the impairment of the kidney in intestinal obstruction is due to a toxin absorbed from the obstructed gut. I have shown[1]—and according to one or two reviewers have made out a good case for my view—that the toxæmia of intestinal obstruction is not due to such a toxin, but to the effect of the persistent vomiting. We have only to consider the structure of the vascular system in the kidney and the dynamics of the blood-flow through this organ to see that undue compression of the organ must militate against its normal manner of functioning, and even to produce pathological changes. The cessation of the vomiting not only prevents further loss of water and of chlorides, it allows the blood-flow through the kidney (and through the liver) to continue undisturbed; and if the reparative powers of these viscera are normal, to cause a return to the normal state. A rapid gain in weight under such conditions is not surprising; to attribute it simply to a retention of chlorides and water is admittedly an assumption. Such conception takes no account of the relationship of the kidney function with protein—muscular—metabolism. It leaves aside altogether the question of the internal secretion of the kidney—thought by some to affect the musculature and thus to be related to body-weight—and which we may with reason suppose suffers when the other functions of the organ have bcome impaired. In short, a very important effect on the body of vomiting has been unconsidered, and until this question is settled progress cannot be made. I have urged before that man consists of so many pounds avoirdupois; that many of his vital acts are mechanically controlled. Man, in short, is a machine, in which the chemical reactions, as elsewhere in the universe, are subservient to physical conditions. To shut our eyes to the physical effects of vomiting on the body, and to see only in this act a chemical change, is to miss an essential point. It is clear the blood-flow through the viscera must be considered, and the effects of acts such as vomiting on this be determined.

I am, Sir, yours faithfully,

Rugby, June 15th, 1924. R. H. Paramore.

THE SCHICK TEST.

To the Editor of The Lancet.

Sir,—May I comment on a few points in the valuable record of observations on the Schick test by Dr. C. B. Ker and Dr. J. McGarrity in your issue of May 31st. We agree with what Dr. Ker finds—i.e., that a "positive and pseudo" reactor can be immunised successfully so that he later becomes a "negative and pseudo" reactor. The mistake referred to in Dr. Ker's letter of June 28th has probably arisen from my careless use of the clumsy terms relating to these two classes of people. In laboratory jargon we speak of a "negative and pseudo" reactor as a "pseudo" reactor, and I have probably unintentionally misled Dr. Ker as to our opinion by saying that a "pseudo" reactor (meaning a "negative and pseudo" reactor) is immune and does not need prophylactic.

The authors quote laboratory work as showing that all antitoxin may have disappeared from the blood in 12 days. I should think this is an unusually short period, though we have recently obtained a clear positive Schick reaction in an adult who received a dose (probably 500 units) of antitoxin 14 days previously. We are at present engaged in examining the blood from a number of patients at various intervals after receipt of diphtheria antitoxin, and we find that the majority of these patients have a small but detectable amount of antitoxin in their blood four to five weeks after the injection of antitoxin. Most of these patients retained so little antitoxin that they would probably have given a positive Schick reaction. We think the laboratory evidence agrees with what Dr. Ker finds from his wide clinical experience—i.e., that a dose of antitoxin gives protection for three weeks. It would be interesting to know whether the nurse who gave a slight reaction on both arms and after being classed as negative developed diphtheria, had a severe or mild attack. We have records of three patients in four years' work who had certainly given a Schick negative reaction, and later on suffered from a sore-throat and yielded virulent K.L.B. in culture. All three patients showed very slight symptoms, and may justifiably be classed with what Dr. Harries calls "a transient tonsillitis associated with the presence of morphological diphtheria bacilli."

Dr. Ker and Dr. McGarrity did not find the reading at 24 hours accurate in a very high percentage of instances. The delay in the appearance of the reaction amongst their patients may be connected with the ill-health of the children. My colleague, Mr. Glenny, finds that in ill- or badly-nourished guinea-pigs the reactions are reduced in intensity and may be delayed. The children quoted in our papers were almost all healthy children, inmates of schools or institutions. We have not had many opportunities recently of making 24-hour readings on large numbers of children, but our evidence in the past year or two confirms the expectation derived from our earlier work that approximately 95 per cent. of *healthy* children will give over-night reactions that agree with later readings.

In view of Dr. Ker's experience, it is evident that further attention must be given to this important point in the future.

I am, Sir, yours faithfully,

R. A. O'Brien.

Wellcome Physiological Research Laboratories,
Beckenham, June 30th, 1924.

THE FORBES FRASER MEMORIAL FUND.

To the Editor of The Lancet.

Sir,—In view of the generally expressed wish that there should be some lasting memorial to the life and work of the late Mr. Forbes Fraser, a small committee, with the Mayor of Bath as chairman, has been formed to consider how best to give effect to this widespread desire. The medical men on the committee include Dr. C. E. S. Flemming, Dr. F. G. Thomson, and Mr. W. G. Mumford. It is felt by the committee that whatever form the memorial takes it should be in some way connected with the recently opened hospital at Combe Park, the inception of which was mainly due to Mr. Forbes Fraser. Not only did the idea originate with him, but it was largely owing to his stimulating influence and untiring energy that the difficulties connected with the building and equipment of the hospital have eventually been overcome. In order to commemorate his work, the hospital committee have decided that the institution shall in future be known as the Forbes Fraser Hospital.

Owing to the limited funds available, it has been found impossible to provide the Forbes Fraser Hospital with certain very necessary equipment. One of the most pressing needs is the provision of a thoroughly well equipped X ray department. Mr. Fraser was himself urgently impressed with this need, and at the time of his illness was actually considering plans for its provision. It is felt by the committee that no fitter memorial to his memory could be devised than to provide the funds necessary to instal this department.

The total cost of the erection and equipment of an X ray department is estimated at from £2500 to £3000; donations may be sent to Mrs. A. L. Hope, Eagle House, Bathford, Somerset, or may be paid direct to the Forbes Fraser Memorial Fund, National Provincial Bank, High-street, Bath.

I am, Sir, yours faithfully,

A. L. Hope,
Hon. Secretary and Treasurer, Forbes Fraser Memorial Fund.

June 28th, 1924.

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[1] The Toxæmia of Acute Intestinal Obstruction; or Vomiting as a Pathological Force. London: H. K. Lewis and Co. 1923.

SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—Mr. Holroyd Slater, in his paper on this subject in THE LANCET of June 21st, says with regard to disadvantages of this method of anæsthesia, "I know of none, provided the technique be correct, save the slight extra work which devolves on the surgeon." May I remind him of a complication which certainly is not common, but which I happen to have seen twice lately, and that is paralysis of one or other sixth cranial nerve. It is by no means a trivial complication, and the resulting diplopia is most confusing and distressing to the patient.

I am, Sir, yours faithfully,
R. FOSTER MOORE.

Harley-street, W., July 1st, 1924.

OSTEOPATHY IN ITS MEDICO-LEGAL ASPECTS: A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—In your report in THE LANCET of June 28th of the meeting of the Medico-Legal Society, at which Dr. Norman J. Macdonald read a paper on this subject, I am credited with certain remarks in the subsequent discussion of the paper. As a matter of fact, though I am a member of the Medico-Legal Society, I was not present at this particular meeting. As the remarks attributed to me by no means represent my views on the subject, I should be much obliged if you would publish this letter, disclaiming them.

I am, Sir, yours faithfully,
ARTHUR S. MORLEY.

Gordon-square, W.C., June 27th, 1924.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

To be Surg. Lts.: J. H. Laydon, J. J. O'Reilly, and J. J. A. O'Sullivan.

ROYAL NAVAL VOLUNTEER RESERVE.

T. W. Drummond, late Temp. Surg. Lt. R.N., to be Surg. Lt. R.N.V.R.

ROYAL ARMY MEDICAL CORPS.

Temp. Capts. H. H. Crickitt and R. B. Hunt (on account of ill-health) relinquish their commns. and retain the rank of Capt.

MILITIA.

Capt. A. E. B. Paul relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. I. M. Pirrie (late R.A.M.C., Militia) to be Capt.

ROYAL AIR FORCE.

Flying Officer V. S. Ewing is promoted to the rank of Flight Lt.

DONATIONS AND BEQUESTS.—Following on the death of Mrs. Mellor the trustees under the will of the late Colonel John James Mellor, of Manchester, who was Member of Parliament for the Radcliffe-cum-Farnworth Division, have made a partial distribution of his charitable bequests, including £1000 each to the Manchester Royal Infirmary, Bury Infirmary, Christie Cancer Hospital, St. Mary's Hospitals for Women and Children, Manchester, and the Children's Hospital, Pendlebury, Manchester, to endow a "Mellor" bed in each institution; also £2500 to found a Mellor Nursing Fund for the provision of a nurse for Whitefield; £1000 to the existing Mellor Convalescent Fund; £1000 for Lytham Cottage Hospital; and £500 to the Manchester and District Surgical Aid Society.—The late Mr. Frederick William Smith, of Ramsgate, left by will £500 to the General Hospital, Monmouth, for a bed to be known as the "Maria Smith Bed," in memory of his mother. Part of the residue of the property he left to the Seamen's Infirmary, Ramsgate, on the death of his wife.

Medical News.

UNIVERSITY OF GLASGOW.—At the graduation ceremony on June 25th, degrees were conferred as follows:—

Hon. LL.D.—Sir Malcolm Watson (Senior District Surgeon, Federated Malay States Medical Service).

M.D. (With Honours).—David Campbell, M.A., B.Sc., M.B., Ch.B. (Thesis: Studies on (1) Rheumatoid Arthritis and its Treatment, with special reference to the use of Non-Specific Protein Reaction; (2) Ionic Medication.) Robert D. Gillespie, M.B., Ch.B. (Thesis: The Physiological Basis of Clinical Tests of Cardiac Efficiency.)—*In Absentia.*

D.Sc.—James H. Paul, M.A., B.Sc., M.B., Ch.B. (Thesis: Studies in Special Crustacean Physiology.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—As the result of the Primary Fellowship Examination held from June 10th to 18th, for which 100 candidates presented themselves, 31 were approved and 69 were rejected. The successful candidates were as follows:—

J. L. Armour, Liverpool; Alfreda Helen Baker, Belfast; H. Barbash, Cambridge and St. Bart.'s; G. M. F. Barnett, Otago and Middlesex; P. G. Bentlif, Cambridge and Middlesex; R. H. Boggon and A. Byrne-Quinn, St. Thomas's; F. A. Bryning, King's Coll. and St. Mary's; H. J. Burrows, Cambridge and St. Bart.'s; J. B. Crabtree, St. Bart.'s; J. L. Diggle, Melbourne and Middlesex; S. W. Drinkwater, Manchester; V. T. Ellwood, Oxford and St. Thomas's; E. S. Frischmann, Manchester and St. Mary's; R. A. Graff, Middlesex; W. A. Gray, Edinburgh and St. Mary's; P. Hack, Guy's; J. A. James, Sydney and Middlesex; R. P. S. Kelman, Otago; V. E. Lloyd, Guy's; E. E. Mackay, Melbourne and Middlesex; J. McMichael, Edinburgh and St. Bart.'s; D. S. Middleton, Edinburgh and St. Mary's; F. W. G. Nash, Middlesex; C. H. Osborn, Melbourne and Middlesex; C. L. Owen, Cambridge; A. M. Reid, Liverpool and Middlesex; J. Roberts, Liverpool; M. P. Susman, Sydney and Middlesex; S. N. Taylor, Manchester and St. Mary's; and C. I. Tuckett, St. Mary's and Middlesex.

ROYAL COLLEGE OF SURGEONS IN IRELAND: *Election of Examiners.*—At a meeting held on June 19th, Mr. Robert C. B. Maunsell, President, in the chair, the following were elected as examiners for the ensuing year:—

Court "A" (Conjoint Licence, Diploma in Public Health, and Preliminary).—Anatomy: Prof. E. J. Evatt. Surgery: Mr. L. G. Gunn and Prof. G. J. Johnston. Physiology and Histology: Prof. J. A. Scott. Pathology and Bacteriology: Prof. W. Boxwell. Midwifery and Gynæcology: Prof. E. H. Tweedy. Biology: Prof. MacD. Cosgrave. Ophthalmology: F. C. Crawley and R. D. Joyce. Chemistry and Physics: Prof. W. Caldwell. Chemistry and Physics, for Diploma in Public Health only: Prof. W. Caldwell and Dr. S. Young. Materia Medica, Pharmacy, and Therapeutics: Prof. R. J. Rowlette. Forensic Medicine and Public Health: Prof. V. M. Synge.

Court "B" (Fellowship, Licence in Dental Surgery).—Anatomy: Prof. E. J. Evatt and Dr. C. M. West. Surgery: Mr. A. Chance, Mr. L. G. Gunn, Prof. G. J. Johnston, and Mr. H. Stokes. Physiology and Histology: Prof. F. C. Purser and Prof. J. A. Scott. Pathology and Bacteriology: Prof. W. Boxwell and Prof. R. J. Rowlette. Chemistry and Physics: Prof. W. Caldwell and Dr. S. Young. Dental Surgery and Pathology: Mr. G. Sheppard and Mr. D. Doolin. Mechanical Dentistry: Mr. D. L. Rogers and Mr. J. Cockburn.

AUGUSTUS AND ALICE WALLER MEMORIAL.—A meeting of subscribers to the fund which has been raised in memory of the late Dr. and Mrs. Augustus D. Waller is to be held at the London (R.F.H.) School of Medicine for Women, on Thursday, July 17th, at 5 P.M. Sir Edward Sharpey Schafer will preside. In inviting contributions the organising committee stated that the Memorial should take the form of a fund for the encouragement of Scientific Research to be administered by the Council of the London (R.F.H.) School of Medicine for Women, and the final arrangements concerning the Memorial will be decided at the meeting. Intending subscribers are asked to send their subscriptions to the Hon. Treasurer, Prof. John Mellanby, St. Thomas's Hospital Medical School, S.E. 1, as soon as possible. £1820 have been subscribed, and it is hoped that the total of £2000 will be reached.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on June 25th, Prof. E. A. Gardner, Yates Professor of Archæology in the University, tenable at University College, was elected Vice-Chancellor for 1924–25 in succession to Mr. H. J. Waring. A cordial vote of thanks was passed to Mr. Waring for the services which he had rendered to the University during his term of office as Vice-Chancellor.—A vote of condolence on the death of Dr. R. M. Walmsley, Chairman of Convocation, was adopted. —The title of Professor of Surgery in the University was conferred on Mr. C. C. Choyce, in respect of his appointment as Director of the Surgical Unit at University College Hospital Medical School.—The title of Professor of Physics in the University was conferred on Prof. O. W. Richardson, F.R.S., in respect of his part-time appointment as Director of Research in the Department of Physics at King's College. Prof. Richardson will cease to hold the Wheatstone Chair of Physics, which he has occupied since 1914, on taking up the Yarrow Research Professorship of the Royal Society on August 1st next.—Nine grants were made out of the Dixon Fund for the year 1924–25 for researches, among which were the following, to be carried out at the College or Institution designated:—To William E. Downey the sum of £50 for (*a*) the spectroscopic study of luminescences and flames, more particularly that of phosphorus; (*b*) the relation between chemical action and light emission. (Imp. Coll., R.C.S.) To Violet M. Grubb the sum of £20 for the continuation of investigation into the structure and reproduction of certain red and green algæ (more particularly the delimitation of species in *Cladophora* and *Gelidium*, and the investigation of spermatial stages in the *Florideæ*). (Botanical Laboratory, Westfield College.) To Alan S. Parkes the sum of £50 for research on the physiological factors governing the proportions of the sexes in mammals, with the object of finding some means whereby the proportions may be controlled. (Institute of Physiology, University College.) To Eric A. Spaul the sum of £50 to continue experiments with the anterior lobe pituitary gland, and to gain further knowledge of the properties of the active principles of this portion of the gland, and also its biochemical properties. (Zoological Laboratory, Birkbeck College.) To Florence M. Wood the sum of £50 for chemicals and apparatus in connexion with research upon the chemical nature of the cellulose membrane. (Probably Birkbeck College.) To Muriel Bond the sum of £20 for research on "The Dietetic Factors Influencing Reproduction." (Physiological Laboratory, London School of Medicine for Women.)

The following doctorates were conferred:—D.Lit.: C. Delisle Burns (London School of Economics) for a thesis entitled "Psychological Data and Moral Standards in Contemporary Industry." D.Sc. in Physiology: J. A. Hewitt (King's College) for a thesis entitled "Metabolism of Carbohydrates (Part III.)." D.Sc. in Physiology: F. M. R. Walshe (University College and University College Hospital Medical School) for a thesis entitled "(i.) The Physiological Significance of the Reflex Phenomena in Spastic Paralysis of the Lower Limbs; (ii.) On Certain Tonic or Postural Reflexes in Man, with Special Reference to the so-called 'Associated Movements'; (iii.) On Variations in the Form of Reflex Movements, notably the Babinski Plantar response, under Different Degrees of Spasticity and Under the Influence of Magnus and de Kleijn's Tonic Neck Reflex."

Prof. H. R. Kenwood was appointed representative (in respect of University College) at the Tenth Annual Conference of the National Association for the Prevention of Tuberculosis to be held in London in July, 1924.—The Maudsley Hospital has been admitted as a School of the University in the Faculty of Medicine for the purpose of research in psychological medicine.

Society for the Prevention of Venereal Disease.—The fifth annual general meeting of the society will take place at the Adam Hall, 12, Stratford-place, London, W., on Thursday, July 10th, at 5.30 P.M., when the President, Sir Auckland Geddes, will deliver his first presidential address. Dr. J. H. Sequeira, Lady Askwith, Captain Walter Elliot, M.P., and Mr. H. Wansey Bayly will also speak.

Diplomas in Psychological Medicine. — The Universities of Cambridge, London, Durham, Leeds, Manchester, and Edinburgh, and the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England now grant Diplomas in Psychological Medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses. Details can be obtained from the various examination bodies. In London, courses of instruction for the Diploma in Psychological Medicine are given at the Maudsley Hospital, Denmark Hill, which has recently been recognised as a school of the University of London. The course consists of two parts, and is adapted for the Diploma of the Conjoint Board, the University of London, or the University of Cambridge, Part I. being conducted by Sir Frederick Mott, Dr. F. Golla, and Dr. Henry Devine, and Part II. by Sir Frederick Mott, Dr. Bernard Hart, Dr. Golla, Dr. F. C. Shrubsall, Dr. W. C. Sullivan, Dr. C. Hubert Bond, and Dr. E. Mapother. Appointments as clinical assistants are obtainable at the hospital, and the holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. Further particulars as to the lectures should be addressed to the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E. 5, and as to clinical facilities to the medical superintendent of the hospital.

Durham University Medical Graduates' Association.—At the annual general meeting of the association, held on June 26th, the following were elected officers for the year 1924–25:—President: Dr. G. de B. Turtle. Vice-Presidents: Dr. A. Parkin and Mr. C. W. Hope. Hon. Secretaries for North and South: Dr. S. W. Davidson and Dr. F. W. M. Pratt respectively. Hon. Treasurer: Dr. W. D. Forrest.

British Association.—The annual meeting of the British Association for the Advancement of Science to be held in Toronto in August will be under the presidency of Major-General Sir David Bruce. The President will deliver the opening address on August 6th on the Prevention of Disease, and will deal with the experience in this field gained during the war. Five hundred members of the Association will travel to Canada for the meeting, which will begin on August 7th and continue until August 13th. The sectional presidential addresses will include discourses on Chemistry and the State, by Sir Robert Robertson; Inter-Racial Problems and White Colonisation in the Tropics, by Prof. J. W. Gregory; and Academic Freedom in Universities, by Principal Ernest Barker.

Royal Sanitary Institute. — The Thirty-fifth Congress of the Royal Sanitary Institute will be held at Liverpool from July 14th to 19th under the presidency of Lord Salisbury. The Congress will consist of 11 sections, and will deal with many aspects of hygiene, in particular maternity and child welfare, public health education, and the value of voluntary public health work. Food and feeding in their several aspects, including milk in its production and also water-supply, will come under discussion. There is a Conference specially devoted to port sanitary authorities, in which ship sanitation will be discussed. As a practical demonstration of many of the subjects, a large health exhibition is held in connexion with the meeting. Among those who will preside over the different sections are Lieut.-General Sir William Leishman, Dr. T. M. Legge, Dr. E. W. Hope, and Dr. T. W. Naylor Barlow. A large attendance is expected, which will consist mainly of officers and representatives of Government departments, municipal and public health departments in the United Kingdom, and including also many representatives of foreign Governments, dominions, and colonies of the Empire. On July 16th Prof. H. R. Kenwood, of London University, will deliver a popular lecture on Modern Civilisation from the Health Standpoint. Full particulars of the Congress may be obtained from the secretary at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1.

The late Dr. C. Burland.—Dr. Charles Burland, formerly senior medical officer to the Marine Department of the Board of Trade, who died on June 29th at his residence in Southampton at the age of 63, was the eldest son of the late Rev. C. I. Burland, vicar of St. Saviour's, Shanklin. He received his early education on H.M.S. *Conway*, and at Yorkshire College, Leeds, and proceeded to the study of medicine at the University of Edinburgh and in Paris. He qualified L.R.C.P., L.R.C.S. Edin. in 1881, and in 1890 graduated with honours M.D. Brussels. During the South African war he was appointed to the medical charge of invalid troops, and obtained for his services the medal with clasp; later he served as surgeon to the P. and O. and Cunard steamship lines. In 1906 he was appointed Board of Trade medical inspector in Glasgow and for the Western District of Scotland, and in 1909 senior medical officer and Government medical inspector of emigration at the port of Liverpool. Two years later he became chairman of the Advisory Committee on Medical Equipment of Merchant Ships. He was an ex-president of the Brussels Medical Graduates' Association. Dr. Burland contributed several papers to The Lancet dealing with points in the treatment of symptomatology of various disease conditions. He was also the author of the well-known "Ship Captain's Medical Guide," published by the Board of Trade, which has gone through 16 editions, and in 1919 he composed the official leaflet on How to Keep Clear of Influenza.

Maternal Mortality. — In a circular letter (No. 517. H.M. Stationery Office. 1*d.*) dated June 30th, addressed to local authorities, the Minister of Health calls special attention to various suggestions for the prevention and remedy of the present high rate of maternal mortality, made by Dr. Janet Campbell in her recent report on this subject, which was discussed in The Lancet dated April 5th (p. 716) and 19th (p. 809). Of these suggestions adequate provision for antenatal supervision is regarded as of primary importance. Antenatal supervision may be given partly through the doctor or midwife engaged by the patient, but also by means of maternity centres established by the local authority.

There are now in this country some 560 antenatal centres, and there is a need for many more. The provision of maternity beds for the institutional treatment of complicated midwifery cases and for women whose homes are unfit for a confinement to take place therein is another essential part of any scheme designed to lower maternal mortality. As to domestic midwifery and maternity nursing, the Minister holds that maternity nursing by trained midwives should be encouraged whether a doctor is engaged or not, and the employment of unqualified "maternity nurses" should be controlled as far as practicable. The searching investigation of all maternal deaths, of cases of puerperal fever, and of stillbirths and neonatal deaths is regarded as desirable, and educational measures are urged in order that an informed and enlightened public opinion in regard to maternal mortality may be created. The Minister suggests, in conclusion, that medical officers of health should be instructed to report upon the steps considered necessary to provide an efficient maternity service in each area, and he announces his readiness to consider any proposals of the local authority for this purpose which may be submitted for his approval under the Maternity and Child Welfare Act, 1918.

INSULIN: REDUCED PRICES.—The second reading of the Public Health (Scotland) Bill, designed to enable local authorities in Scotland to assist diabetics unable to afford insulin to obtain this remedy, was passed by the House of Commons on July 1st. The reduction in the price of insulin is proceeding so rapidly that legislation may soon be unnecessary. The first insulin made in this country a little over 12 months ago cost 25*s.* for 10 doses. Messrs. Burroughs and Wellcome now inform us that following improved manufacturing methods carried out in their laboratories, they are able to announce a fifth reduction in the price of "Wellcome" Brand Insulin. The British Drug Houses, Ltd., announce a similar reduction in the "A.B." Brand, manufactured jointly by this firm and Allen and Hanburys; and Messrs. Boots and Co., Ltd., of Nottingham, have similarly reduced their price. The new price, which came into force on July 1st, is 2*s.* 8*d.* per phial of 100 units (10 average doses).

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, JUNE 30TH.

LIQUOR (POPULAR CONTROL) BILL.

THE debate was resumed on the amendment for the rejection of the Liquor (Popular Control) Bill, moved by Lord Banbury.

Lord DAWSON said that it was common ground that the consumption of alcohol in this country was far too great, and that the nation spent far too much upon it. But in searching for a cure they needed to be watchful that their proposals did not replace one evil by another. He was not enamoured of the constant quotation of America. He did not like to think that we were so sterile in imagination that we could not find our own remedies for our own social evils. Surely the best remedy was that which was founded upon causes and emotions, and he hoped to show their lordships that this country was not only becoming temperate but in an accelerated degree; and if the conditions which were responsible for the improvement were only fostered and furthered they could face the solution of this dire problem with greater ease of mind than in the past. It might be taken that the opinion of the medical world, both in this country and abroad, was by a very large majority in favour of alcohol as a useful substance, a beneficent agent when taken in proper quantities, at proper times, and by people whom it suited. The majority of the medical profession themselves drank wine, though in strict moderation. It was perfectly true that the action of alcohol was in no way useful to those who were occupied in physical or mental labour. It was further admitted that although it was a food it was an unsuitable and wasteful food to those who were in health. But the action of alcohol on the nervous system was beneficent and useful when taken in proper quantities and at the proper time. It was almost a matter of common knowledge that a glass of alcoholic liquor at the end of the day would lighten the mental horizon, brighten the outlook, and enable a man to drop those grey-coloured spectacles with which he viewed the world after the hardships of the day, and give him content, ease of mind, and happiness. They ought to do nothing which would diminish the cheerfulness and the measure of sociability which was so helpful in helping us along our mortal road. He did not think they were helped forward by denunciations of alcohol as a narcotic. If alcohol was wrong then the whole community ought to give it up. But this Bill was class legislation, which would never interfere with the man who was able to have alcohol in his cellars.

Referring to the evidence afforded by disease regarding the effect of alcohol, Lord Dawson said that if a man had been intemperate and had an accident or was stricken by fever he was liable to develop delirium tremens. If they took the figures of one large hospital for the three decades comprised between the years 1894 and 1923 they found that, beginning at 27·8 per year, they went down to 17·6 in 1901–13 and finally to 10. Taking another well-known disease produced by alcohol—namely, cirrhosis of the liver—for the same three periods the average admissions in the first decade numbered 61·4, in the second 53·2, and in the third 20. Thirdly, there was another disease, more common perhaps among women than among men—viz., alcoholic peripheral neuritis. The figure was 23·8 in the first decade, 14·1 in the second, and 5 in the third. Side by side with those figures he would put the statistics of the consumption of beer for the same years. In the first decade the consumption was 29·52 gallons per head of the population, in the next decade 28·91, in the next 26·66, and when they came down to the last year the figure was 15·80. As to the consumption of spirits, in the first decade the figure was 0·87 gallon per head of the population, for the second decade 0·85, for the third 0·59, and at present 0·31. Quoting from 200 examples of healthy people as afforded in the experience of a big insurance company, Lord Dawson said of those over 40 years of age 21 per cent. took no alcohol, of those under 40, 40 per cent. took no alcohol, and of those who did take it only one-fourth took spirits. He would say leave these restrictive measures alone and proceed on the line that if the people were given better houses, and more recreation grounds, they would do the rest.

The debate was adjourned.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 25TH.

Tuberculous Naval Invalids.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty whether any of the tuberculous naval invalids included in the 97·9 percentage for 1923, considered to be non-attributable to service, had questioned the opinion arrived at by naval medical boards; and whether an opportunity would be afforded these men to appeal to an independent tribunal if and when the institution of an appeal tribunal was approved.—Mr. AMMON replied: The answer to the first part of the question is in the affirmative. As regards the second part of the question, the matter is still under consideration.

Naval Lunatic Ratings.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty why naval lunatic ratings, whose insanity was attributable to service, had their pensions withheld and appropriated to the cost of their maintenance: and whether he would consider a revision of the regulations, authorising payment of pensions in those cases to their wives or dependents.—Mr. AMMON replied: Under Section 335 of the Lunacy Act (53 Vict. c. 5) the cost of maintenance is a first charge against a lunatic's pension, and the King's Regulations do not permit the concurrent payment of pension and the provision of free maintenance of the pensioner. I am afraid that I cannot consider revision of these regulations in the sense suggested, but I would point out that under present conditions by reason of the higher rate of an "attributable" pension the wives or dependents of men whose disabilities are due to the service receive higher money allowances from Greenwich Hospital funds.

Increase in the Population and Housing.

Mr. ERNEST SIMON asked the Minister of Health whether he was aware of Prof. Bowley's recent estimate that the rate of increase of the population of Great Britain would steadily become less during the next two decades, and that the population would actually become stationary about 1941; and whether he had taken any steps to investigate this estimate, which had so vital a bearing on the question of how many new houses would be needed during the next 15 years.—Mr. WHEATLEY replied: Perhaps I may refer the hon. Member to the very carefully prepared statement by the Registrar-General's department on the factors governing the growth of our population and the tendencies at present discernible, which is contained in Appendix V. of the recently issued report of the Overseas Settlement Committee (Command Paper 2107). The broad conclusions at which the department arrive are that we are at present too near the war and too much involved in the abnormalities resulting from it to attempt with confidence any estimate of the future movement of population, but that there is no safe ground for assuming that there has yet been any in the University was conferred on Prof. O. W. Richardson, F.R.S., in respect of his part-time appointment as Director of Research in the Department of Physics at King's College. Prof. Richardson will cease to hold the Wheatstone Chair of Physics, which he has occupied since 1914, on taking up the Yarrow Research Professorship of the Royal Society on August 1st next.—Nine grants were made out of the Dixon Fund for the year 1924–25 for researches, among which were the following, to be carried out at the College or Institution designated :—To William E. Downey the sum of £50 for (*a*) the spectroscopic study of luminescences and flames, more particularly that of phosphorus; (*b*) the relation between chemical action and light emission. (Imp. Coll., R.C.S.) To Violet M. Grubb the sum of £20 for the continuation of investigation into the structure and reproduction of certain red and green algæ (more particularly the delimitation of species in *Cladophora* and *Gelidium*, and the investigation of spermatial stages in the *Florideæ*). (Botanical Laboratory, Westfield College.) To Alan S. Parkes the sum of £50 for research on the physiological factors governing the proportions of the sexes in mammals, with the object of finding some means whereby the proportions may be controlled. (Institute of Physiology, University College.) To Eric A. Spaul the sum of £50 to continue experiments with the anterior lobe pituitary gland, and to gain further knowledge of the properties of the active principles of this portion of the gland, and also its biochemical properties. (Zoological Laboratory, Birkbeck College.) To Florence M. Wood the sum of £50 for chemicals and apparatus in connexion with research upon the chemical nature of the cellulose membrane. (Probably Birkbeck College.) To Muriel Bond the sum of £20 for research on "The Dietetic Factors Influencing Reproduction." (Physiological Laboratory, London School of Medicine for Women.)

The following doctorates were conferred :—D.Lit.: C. Delisle Burns (London School of Economics) for a thesis entitled "Psychological Data and Moral Standards in Contemporary Industry." D.Sc. in Physiology: J. A. Hewitt (King's College) for a thesis entitled "Metabolism of Carbohydrates (Part III.)." D.Sc. in Physiology: F. M. R. Walshe (University College and University College Hospital Medical School) for a thesis entitled "(i.) The Physiological Significance of the Reflex Phenomena in Spastic Paralysis of the Lower Limbs; (ii.) On Certain Tonic or Postural Reflexes in Man, with Special Reference to the so-called 'Associated Movements'; (iii.) On Variations in the Form of Reflex Movements, notably the Babinski Plantar response, under Different Degrees of Spasticity and Under the Influence of Magnus and de Kleijn's Tonic Neck Reflex."

Prof. H. R. Kenwood was appointed representative (in respect of University College) at the Tenth Annual Conference of the National Association for the Prevention of Tuberculosis to be held in London in July, 1924.—The Maudsley Hospital has been admitted as a School of the University in the Faculty of Medicine for the purpose of research in psychological medicine.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.—The fifth annual general meeting of the society will take place at the Adam Hall, 12, Stratford-place, London, W., on Thursday, July 10th, at 5.30 P.M., when the President, Sir Auckland Geddes, will deliver his first presidential address. Dr. J. H. Sequeira, Lady Askwith, Captain Walter Elliot, M.P., and Mr. H. Wansey Bayly will also speak.

DIPLOMAS IN PSYCHOLOGICAL MEDICINE. — The Universities of Cambridge, London, Durham, Leeds, Manchester, and Edinburgh, and the Conjoint Board of the Royal College of Physicians of London and the Royal College of Surgeons of England now grant Diplomas in Psychological Medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses. Details can be obtained from the various examination bodies. In London, courses of instruction for the Diploma in Psychological Medicine are given at the Maudsley Hospital, Denmark Hill, which has recently been recognised as a school of the University of London. The course consists of two parts, and is adapted for the Diploma of the Conjoint Board, the University of London, or the University of Cambridge, Part I. being conducted by Sir Frederick Mott, Dr. F. Golla, and Dr. Henry Devine, and Part II. by Sir Frederick Mott, Dr. Bernard Hart, Dr. Golla, Dr. F. C. Shrubsall, Dr. W. C. Sullivan, Dr. C. Hubert Bond, and Dr. E. Mapother. Appointments as clinical assistants are obtainable at the hospital, and the holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. Further particulars as to the lectures should be addressed to the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E. 5, and as to clinical facilities to the medical superintendent of the hospital.

DURHAM UNIVERSITY MEDICAL GRADUATES' ASSOCIATION.—At the annual general meeting of the association, held on June 26th, the following were elected officers for the year 1924–25 :—President: Dr. G. de B. Turtle. Vice-Presidents: Dr. A. Parkin and Mr. C. W. Hope. Hon. Secretaries for North and South: Dr. S. W. Davidson and Dr. F. W. M. Pratt respectively. Hon. Treasurer: Dr. W. D. Forrest.

BRITISH ASSOCIATION.—The annual meeting of the British Association for the Advancement of Science to be held in Toronto in August will be under the presidency of Major-General Sir David Bruce. The President will deliver the opening address on August 6th on the Prevention of Disease, and will deal with the experience in this field gained during the war. Five hundred members of the Association will travel to Canada for the meeting, which will begin on August 7th and continue until August 13th. The sectional presidential addresses will include discourses on Chemistry and the State, by Sir Robert Robertson; Inter-Racial Problems and White Colonisation in the Tropics, by Prof. J. W. Gregory; and Academic Freedom in Universities, by Principal Ernest Barker.

ROYAL SANITARY INSTITUTE. — The Thirty-fifth Congress of the Royal Sanitary Institute will be held at Liverpool from July 14th to 19th under the presidency of Lord Salisbury. The Congress will consist of 11 sections, and will deal with many aspects of hygiene, in particular maternity and child welfare, public health education, and the value of voluntary public health work. Food and feeding in their several aspects, including milk in its production and also water-supply, will come under discussion. There is a Conference specially devoted to port sanitary authorities, in which ship sanitation will be discussed. As a practical demonstration of many of the subjects, a large health exhibition is held in connexion with the meeting. Among those who will preside over the different sections are Lieut.-General Sir William Leishman, Dr. T. M. Legge, Dr. E. W. Hope, and Dr. T. W. Naylor Barlow. A large attendance is expected, which will consist mainly of officers and representatives of Government departments, municipal and public health departments in the United Kingdom, and including also many representatives of foreign Governments, dominions, and colonies of the Empire. On July 16th Prof. H. R. Kenwood, of London University, will deliver a popular lecture on Modern Civilisation from the Health Standpoint. Full particulars of the Congress may be obtained from the secretary at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1.

THE LATE DR. C. BURLAND.—Dr. Charles Burland, formerly senior medical officer to the Marine Department of the Board of Trade, who died on June 29th at his residence in Southampton at the age of 63, was the eldest son of the late Rev. C. I. Burland, vicar of St. Saviour's, Shanklin. He received his early education on H.M.S. *Conway*, and at Yorkshire College, Leeds, and proceeded to the study of medicine at the University of Edinburgh and in Paris. He qualified L.R.C.P., L.R.C.S. Edin. in 1884, and in 1890 graduated with honours M.D. Brussels. During the South African war he was appointed to the medical charge of invalid troops, and obtained for his services the medal with clasp; later he served as surgeon to the P. and O. and Cunard steamship lines. In 1906 he was appointed Board of Trade medical inspector in Glasgow and for the Western District of Scotland, and in 1909 senior medical officer and Government medical inspector of emigration at the port of Liverpool. Two years later he became chairman of the Advisory Committee on Medical Equipment of Merchant Ships. He was an ex-president of the Brussels Medical Graduates' Association. Dr. Burland contributed several papers to THE LANCET dealing with points in the treatment of symptomatology of various disease conditions. He was also the author of the well-known "Ship Captain's Medical Guide," published by the Board of Trade, which has gone through 16 editions, and in 1919 he composed the official leaflet on How to Keep Clear of Influenza.

MATERNAL MORTALITY. — In a circular letter (No. 517. H.M. Stationery Office. 1*d.*) dated June 30th, addressed to local authorities, the Minister of Health calls special attention to various suggestions for the prevention and remedy of the present high rate of maternal mortality, made by Dr. Janet Campbell in her recent report on this subject, which was discussed in THE LANCET dated April 5th (p. 716) and 19th (p. 809). Of these suggestions adequate provision for antenatal supervision is regarded as of primary importance. Antenatal supervision may be given partly through the doctor or midwife engaged by the patient, but also by means of maternity centres established by the local authority.

Public Health By-laws.

Mrs. Wintringham asked the Home Secretary how many local authorities had power, under Section 85 of the Public Health Acts Amendment Act, to make by-laws with regard to the public control of agencies for domestic service, and how many had exercised such power.—Mr. Henderson replied: 96 cities or boroughs, 72 urban districts, and 2 rural districts have obtained orders declaring Section 85 in force in their areas. By-laws have been made by 38 cities or boroughs, 17 urban districts, and 1 rural district.

Eyesight Test for Omnibus Drivers.

Mr. Godfrey Locker-Lampson asked the Home Secretary whether the police were making arrangements for an eyesight test for drivers of omnibuses.—Mr. Henderson replied: For many years the production of a certificate of physical fitness has been required, and this certificate includes the question of vision.

Appeal Court for Criminal Lunatics.

Mr. Compton asked the Home Secretary whether there existed any court of appeal for the inmates of the criminal asylum at Broadmoor similar to the Court of Criminal Appeal provided for prisoners, and if not, will this question be included in the terms of reference for the Royal Commission on Lunacy.—Mr. Henderson replied: No, Sir. A verdict of guilty but insane is technically a verdict of acquittal from which no appeal to the Court of Criminal Appeal can lie. The proper authority to consider representations with respect of such a case is the Home Secretary. The answer to the second part of the question is in the negative. Questions of criminal responsibility are, I understand, outside the scope of the Royal Commission on Lunacy.

Royal Commission and Asylum Inmates.

Mr. McEntee asked the Prime Minister if he would arrange that adequate facilities be given to the inmates of asylums to bring to the notice of the Royal Commission circumstances and conditions which, owing to the secrecy prevailing in lunacy institutions, did not usually come under the cognisance of the medical officers in charge thereof.—Mr. Greenwood replied: It will rest with the Royal Commission to decide what procedure they will adopt to inquire into the points to which my hon. friend refers or receive evidence upon them. The Royal Commission will also have full power to visit mental hospitals in order to acquaint themselves with the conditions prevailing.

Royal Commission on Lunacy.

Mr. Robert Richardson asked the Prime Minister if he would give some indication as to how soon it was his intention to appoint the promised Royal Commission to inquire into the defects in the Lunacy Law and administration, and what were to be its composition and terms of reference.—Mr. Greenwood replied: A statement was published on Tuesday giving the composition of the terms of reference of the Royal Commission, and a copy will be sent to my hon. friend.

Bad Housing in Southwark.

Mr. Naylor asked the Minister of Health if his attention had been drawn to the further comments made by the Southwark coroner on the housing conditions in that borough, and to his suggestion that immediate provision should be made for the clearance of slum property and the erection of temporary accommodation for the persons so displaced, pending the building of houses under the Government scheme; and whether the Minister would consider how the problem of the slum areas could be more effectively provided for.—Mr. Greenwood replied: My right hon. friend has received a communication from the Southwark coroner on this matter. The Housing Act of 1923 provides for a Exchequer contribution on a half-and-half basis towards the cost of slum clearance schemes (including the re-housing of the occupants) undertaken by local authorities. Since 1919 11 such schemes have been confirmed in the County of London, and others are under consideration.

Housing in Rural Parishes.

Mr. Ernest Brown asked the Minister of Health the number of houses to the acre it was proposed to build in agricultural parishes under the Housing (Financial Provisions) Bill.—Mr. Greenwood replied: The matter is primarily one for the local authorities. Under the Housing Acts a cottage provided by a local authority may include a garden of not more than one acre. The general advice given by my department is that in agricultural areas houses should not, unless there are special circumstances, be built at more than eight to an acre.

Treatment of Early Mental Cases.

Mr. Robert Richardson asked the Minister of Health how many asylums had been, or are about to be, opened this year; was he aware that the Mental Hospitals' Association reported in 1922 vacancies in public asylums to the extent of 18,000 beds which had apparently been now filled up: and, in view of the increase in insanity thus indicated, an increase undoubtedly traceable to lack of preventive measures, would he reconsider the question of encouraging by Parliamentary grant the provision under health committees, as distinct from asylum committees, of hospitals quite apart from lunacy administration, where uncertifiable cases might have the benefit of such early and appropriate care as might promote their speedy recovery without the risk and detriment of being placed under lunacy control.—Mr. Greenwood replied: One new public mental hospital has been or will be opened this year. With regard to the latter part of the question I would refer the hon. Member to the reply given on June 5th.

Officers' Wound Pensions.

Sir Thomas Bramsdon asked the Minister of Pensions if, in cases of officers in receipt of pensions for wounds which were certified as not equivalent to the loss of a limb, and which the disabled officer claimed were so equivalent and produced the necessary medical evidence to that effect, he would consider whether it was possible to allow these questions affecting these officers to be dealt with by the House of Lords tribunal, as at present they had no redress further than a pension appeal board.—Mr. F. O. Roberts replied: Wound pensions are outside the scheme of final awards and the statutory Final Awards Regulations. They are in the nature of exceptional provision for a particular type of disability not determined by the general scale of assessment for disablement. Wound pensions, like wound gratuities, are administered, not under Ministry warrants, but under regulations common to the service departments and the Ministry of Pensions, and appeals are most carefully considered by a central board, which includes eminent surgeons.

St. Andrew's Mental Hospital, Northampton.

Mr. Robert Richardson asked the Minister of Health: (1) In how many cases had a petition prepared by the manager of St. Andrew's Hospital, Northampton, and presented by him to a judicial authority, for an order to detain a voluntary boarder as a lunatic been found, on examination by the Board of Control, to differ from the copy supplied to the Board by the manager under the provisions of Section 316 of the Lunacy Act, 1890; in how many such cases did the statement of a reason for not calling in the boarder's usual medical attendant appear unsigned by the petitioner in the original but signed in his name in the official copy; and in how many was the date of presentation of the petition as given by the petitioner altered in the official copy in such manner as to bring it into conformity with the date of the above-mentioned statement forming part of the petition; what steps had been taken under the direction of the Board of Control to ascertain whether any such false entries were knowingly made or whether they were due to mere accident or oversight; and what disciplinary measures had been taken in either case under the terms of Sections 318 or 320 of the Lunacy Act, 1890. (2) In how many cases in which a petition for a judicial order changing the status of a voluntary boarder at St. Andrew's Hospital, Northampton, to that of a certified lunatic, had been posted by the petitioner to the manager of this private asylum prior to its presentation to a judicial authority, and had been presented by the manager or his agent without having again been in the hands of the petitioner, had such petition been found, on examination by the Board of Control, to contain an entry in the handwriting of the manager or his agent bearing a date subsequent to the date appearing in the handwriting of the petitioner against his signature; and in how many such cases had it been made to appear in the copy sent to the Board of Control that the petitioner signed on the later date, by the substitution in the copy of the later date for the earlier date given by the petitioner against his signature.—Mr. Wheatley replied: There has been one such case. As the hon. Member is aware, the details of this case have already received full consideration, not only by the Board of Control, but by the courts; and no disciplinary measures have been deemed necessary.

Monday, June 30th.

Government and the Summer Time Bill.

Sir Kingsley Wood asked the Prime Minister whether the Government would now provide facilities for the Summer Time Bill.—The reply was: The Government have decided to adopt this Bill, which they desire to see passed into law this session.

Cost of Public Health Services.

Lieut.-Colonel Horlick asked the Chancellor of the Exchequer what was the total cost of our public health services, including that of National Health Insurance and the grants in aid for services administered by the Ministry of Health and the Board of Education; what proportion was paid by the State and what by the local authorities: and whether he could give an estimate of the cost of the proposed revision of the Public Health Acts that was under permanent departure from the conditions which during the last 50 years have resulted in a natural increase of approximately 400,000 per annum for Great Britain.

Poor-law Officers and Poor-law Reform.

Mr. LORIMER asked the Minister of Health if, when he set up a departmental committee to consider a report upon the Poor-law administration throughout the country, he would give the Poor-law Officers' Union an opportunity to present their views.—Mr. WHEATLEY replied : There is no present intention of setting up such a departmental committee as is suggested. I have already intimated that I shall be glad to consider any suggestions which the Union may think fit to place before me.

Disinfection of East India Wool.

Mr. WARDLAW-MILNE asked the Minister of Health the intention of the Government regarding the suggested compulsory disinfection of East India wool ; whether he was aware that if this regulation was brought into force it was probable that the article secured would be inferior in quality, thus resulting in a serious handicap upon the carpet trade of this country ; whether, as it was advisable to put all buyers on equal terms if disinfection was proved to be necessary at all, he would consider the possibility of arranging for this disinfection to be carried out at the source of supply ; and if he would suspend the bringing of such an order into force pending full and proper inquiry into the whole matter.—Mr. HENDERSON (Home Secretary) replied : The whole matter is being fully considered and no decision has yet been taken. I am not aware of any foundation for the allegation in the second part of the question.

Public Enlightenment on Venereal Disease.

Mr. SNELL asked the Minister of Health whether the question of the assignment of the sum allocated for public enlightenment regarding venereal disease had yet been settled ; whether the Society for the Prevention of Venereal Disease, whose valuable work in the education of the public regarding the medical prevention of venereal disease was universally acknowledged, would receive a share of such a grant ; and whether the Ministry of Health had accepted the recommendations contained in the recent report of the committee of inquiry upon the best medical measures for preventing venereal disease in the civil community.—Mr. WHEATLEY replied : The answer to the first part of the question is No. As regards the second and third parts, I can only say that the recommendations contained in the report mentioned in the question are still under consideration.

Smoke Abatement Bill.

Mr. ERNEST SIMON asked the Minister of Health when he proposed to introduce a Smoke Abatement Bill.—Mr. WHEATLEY replied : The Bill will be introduced in another place within the next few days.

Slum Areas in London.

Mr. GILBERT asked the Minister of Health the number of slum areas in the County of London his department had given sanction to for clearance under the Housing Act of last year, and approximately the number of houses, the total area, and the number of persons such clearance schemes had dealt with.—Mr. WHEATLEY replied : Three schemes in the County of London were confirmed in 1923 and 1924, comprising 668 houses, an area of approximately 13 acres, and a population of 3760. Several other schemes are under consideration.

Women in the Ministry of Health.

Mrs. WINTRINGHAM asked the Minister of Health whether, seeing that questions as to the administration of the health insurance benefits of insured women were dealt with in the insurance branch of the Ministry of Health, how many posts there were in this branch above the lower clerical grade ; and how many of these posts were filled by women.—Mr. WHEATLEY replied : There are 385 posts in the insurance branch of the Ministry above the lower clerical grade, and of these 94 are held by women. Included in the total of 385 are 222 posts on the outdoor staff of the branch, and of these 59 are held by women.

Hospitals and Public Funds.

Mr. ALFRED T. DAVIES asked the Minister of Health how many London and provincial hospitals were supported, or receive assistance from, public funds, and what are the respective amounts allocated ; whether he was aware that over 200 beds were now closed in two hospitals in London alone for want of funds ; that over 10,000 persons in London alone had been accepted by the hospitals for operations or treatment and could not be admitted ; whether the Ministry had the hospital system of London and the provinces under review ; and what it was proposed to do, if anything, to relieve or improve the present state of affairs.—Mr. WHEATLEY replied : The Voluntary Hospitals Commission completed the distribution of the grant from public funds administered by them at the end of the last financial year. No hospitals are now receiving direct assistance from public funds, but many receive from local authorities contributions towards the cost of certain grant-aided services which are subsidised jointly from public and local funds. I am aware that two of the large London hospitals have closed beds, but more than half of the closed beds have at no time been available to the civil population, and have never been occupied except by military patients during the war. I have no exact information as to the extent of the waiting lists, but this is one of the questions now being investigated by the Voluntary Hospitals Commission, who have been asked to report on the extent of the additional accommodation required in voluntary hospitals and the best means of providing and maintaining it.

Assaults on Girls.

Sir THOMAS BRAMSDON asked the Home Secretary if he would explain what was the present position of the departmental committee which he had decided to set up to inquire into the question of assaults on girls ; and whether he was in a position to state who the members of that departmental committee would be.—Mr. HENDERSON replied : I regret the delay in setting up this committee, which has been largely due to a difficulty in connexion with the appointment of a chairman. I now hope to be in a position to proceed with the appointment very shortly.

Mercantile Officers and Eyesight Tests.

Mr. BALFOUR asked the President of the Board of Trade whether his attention had been drawn to the fact that executive officers of the mercantile marine might pass Board of Trade standards even if blind in one eye ; and, in view of the fact that such a state of things was not consistent with safe navigation and that Germany and other competing nations had a superior physical standard in this matter, whether he would have inquiry made into the matter.—Mr. ALEXANDER replied : Very careful consideration was given, some years ago, to the question whether the Board of Trade sight tests should lay down a standard for each eye, or should allow the standard of form vision required to be reached by a candidate using both eyes together, or either eye separately, at the option of the candidate. The present rule gives this option to the candidate, and accordingly it is possible, as suggested in the question, that a candidate may pass the Board of Trade sight tests even if blind in one eye. I am not aware that any serious consequences have resulted from the present rule, which has been in force since 1912, but if the hon. Member will communicate to me any evidence suggesting that the present rule has had serious consequences, I am prepared to reconsider the general question.

THURSDAY, JUNE 26TH.

Restrictions at Edenhall Hospital.

Mr. CLARKE asked the Minister of Pensions if he was aware that considerable hardship and irritation was being caused by the officer in charge at Edenhall Hospital, Musselburgh, in imposing unnecessary and unreasonable restrictions on the men under his charge and in using questionable methods in applying the regulations dealing with ordinary breaches of discipline ; and, if not, would he cause inquiry to be made with a view to securing greater harmony than at present prevails.—Mr. F. O. ROBERTS replied : At a recent inspection of this institution by medical officers, including a neurologist, two cases of complaint were brought forward, but in neither instance was the complaint established. I am not aware of any justification for the general charge made against this officer, whose conduct of the institution, which I have personally inspected within the past few days, appears to be highly efficient. I should add that neurasthenic patients, to whose treatment the hospital in question is devoted, at all times offer special difficulties in management, and the recent medical inspection showed that cases of varying types which could not suitably be associated with others had been admitted to the institution. This has now been put right by the transfer of certain cases to more suitable institutions under the Ministry.

Pensioners and Final Appeals.

Mr. JOHN GUEST asked the Minister of Pensions whether, in view of the failure of many appellants to the final appeals court to understand the medical précis supplied them by the Ministry in preparation for such appeal and also their inability owing to illness or the effect of wounds adequately to present their case, the pension authorities would make some suitable provision by which the appellant in presenting his claim might have the assistance of his local doctor, who was in most instances familiar with the case.—Mr. F. O. ROBERTS replied : Under the rules made by the Lord Chancellor, the tribunal is required to assist any appellant who, through ignorance or otherwise, is unable to make the best of his case. Moreover, the tribunal is empowered at its discretion to summon before it expert or other witnesses to give oral evidence. Any question as to an extension of this provision would be a matter for the consideration of the Lord Chancellor.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 7th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Dept.

TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 11 A.M., Mr. Endean: Venereal Diseases. 2 P.M., Dr. Burrell: Medical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M. Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

THURSDAY, July 10th.—5 P.M., Mr. Richard Lake: Intra-Cranial Complications of Middle-Ear Diseases. (Geoffrey E. Duveen Lectures in Otology.)

HOSPITAL FOR SICK CHILDREN, Gt. Ormond-street, W.C.

THURSDAY, July 10th.—4 P.M., Mr. Barrington Ward: Intestinal Obstruction.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.

TUESDAY, July 8th.—5 P.M., Dr. Haldin Davis: Acne.

Appointments.

CASTLE, W. F. L., M.B., Ch.B., has been appointed Assistant House Surgeon, Jessop Hospital for Women, Sheffield.

COBB, G. F., M.R.C.S., L.R.C.P. Lond., Senior Assistant Medical Officer and Deputy Medical Superintendent of the Burntwood County Mental Hospital, near Lichfield, Staffs.

CUBBON, H. T., M.B., B.Ch. Camb., Second Electro-Therapeutist, Royal Sussex County Hospital.

HOBLING, J. H., L.M.S.S.A. Lond., Certifying Surgeon under the Factory and Workshop Acts for Lostwithiel.

LANE-ROBERTS, C. S., M.S. Lond., F.R.C.S. Eng., Obstetric Surgeon to Out-patients, Queen Charlotte's Maternity Hospital.

ROLSTON, J. R., L.R.C.P. Edin., M.R.C.S., Consulting Ophthalmic Surgeon to the South Devon and East Cornwall Hospital, Plymouth.

YOUNG, A., M.B., C.M. Glasg., one of the Medical Referees under the Workmen's Compensation Act for the County of Lanark.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—S.
Birmingham, Queen's Hospital.—Surg. Reg. £100.
Blackburn, Calderstones, Whalley.—Asst. M.O. £440 16*s.* 11*d.*
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—R.M.O.
Coventry and Warwickshire Hospital.—H.P. £150. Also Jun. H.S. £130.
Durham, Richard Murray Hospital, Blackhill.—R.M.O. £400.
Gilbert and Ellice Islands Colony.—Sen. M.O. £650.
Guy's Hospital.—Part-time M.O. in Venereal Dis. Dept. £550.
Guy's Hospital Dental School, London Bridge, S.E.—Sen. Dent. O. and Clin. Tutor. £300.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Gynæcologist.
Hong-Kong University, Faculty of Medicine.—Professor of Obstetrics and Gynæcology. £800.
Hospital for Consumption and Diseases of Chest, Brompton.—R.M.O. and Reg. £500. Also H.P. £50.
Hull City Mental Hospital.—Sen. Asst. M.O., &c. £600.
King's Lynn, West Norfolk Hospital.—Res. Surg. O. £300–£350.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
Leicester Royal Infirmary.—H.P. £125.
Liverpool Royal Infirmary.—Hon. Asst. P.
London Hospital.—Second Reg. to Ear, Nose, and Throat Dept.
Margate, Royal Sea Bathing Hospital.—H.S. £200.
Metropolitan Hospital, Kingsland-road, E.—Asst. Dent. S.
Middlesex Hospital, W.—Res. M.O. £250.
Northampton County Mental Hospital, Berrywood, near Northampton.—Locum Tenen's M.O. £8 8*s.* weekly.
Northampton General Hospital.—Sec. Supt. £400.
Norwich, Norfolk and Norwich Hospital.—Anæsth. £300.
Queen's Hospital for Children, Hackney, E.—Asst. Cas. H.S. £100. Also Asst. S. to Ear, Nose, and Throat Dept.
Royal Army Medical Corps.—20 Commissions.
Royal Chest Hospital, City-road, E.C.—P. to Out-patients.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and H.S.
Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Reg. and Clin. Asst. 100 guineas.
St. Bartholomew's Hospital.—Asst. Administrator of Anæsthetics.
St. Bartholomew's Hospital Medical College.—Demonstrator of Physiology.
St. Mary's Hospital, W.—Cas. H.S. £100.
St. Mary's Infirmary, Highgate-hill.—A.M.O. £350.
St. Thomas's Hospital.—Visiting Anæsth.
Sheffield Children's Hospital.—H.S. £125.
University College Hospital, Gower-street, W.C.—Tub. O. £300.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Ophth. S.
Warrington Infirmary and Dispensary.—Jun. H.S. £175.
West London Hospital, Hammersmith-road, W.—Asst. Anæsth.
Wolverhampton and Staffordshire Hospital.—Pathologist and Bacteriologist. £600.
York City Mental Hospital, Fulford.—Asst. M.O. £440.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Castleton, Yorks, North Riding; and Melling, Lancs.

Births, Marriages, and Deaths.

BIRTHS.

BOWES.—On June 27th, at de Vaux-place, Salisbury, the wife of G. K. Bowes, M.D., M.R.C.P., of a son.

DUNLOP.—On June 19th, at Elm Cottage, Hendon, to Dr. Doris Howard, wife of Dr. W. A. L. Dunlop—a daughter.

GIRDWOOD.—On April 18th, at Johannesburg, the wife of Dr. R. L. Girdwood, of a daughter.

GRANT.—On June 27th, at York, the wife of Major M. F. Grant, R.A.M.C., of a daughter.

MARRIAGES.

WILSON—LAMPORT.—On June 24th, at the Parish Church, Lancaster, by the Rev. J. W. N. Bardsley, vicar, assisted by the Rev. J. L. Gamble, vicar of Milnthorpe, Henry Wilson, *M.C.*, M.B., Ch.B., of "Whitmore," Gatley, Cheshire, son of Henry Wilson, M.R.C.S., and Mrs. Wilson, of Cheadle, Cheshire, to Florence Marjorie Lamport, M.B., Ch.B., younger daughter of H. C. Lamport, M.B., C.M., and Mrs. Lamport of Lancaster.

DEATHS.

DOW.—On June 22nd, at Comely Park House, Dunfermline, William Barrie Dow, M.D., F.R.C.S. Edin., LL.D., in his 89th year.

FERGUSON.—Robert Bruce Ferguson, M.A., M.D. Cantab., D.P.H., &c., at "Marton" Catherine-road, Surbiton, formerly of New Southgate.

PENNY.—On June 22nd, at Liverpool, Dr. Alfred Ferguson Penny, F.R.C.S. Irel., late of Chelsea, in his 59th year.

STEWART.—On June 30th, at Melville-street, Edinburgh, Charles Hunter Stewart, M.B., C.M., D.Sc., Professor of Public Health, University of Edinburgh, aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

A CONVENIENT OPERATION TABLE.

WE have received from Messrs. Mayer and Phelps a descriptive catalogue of recent surgical instruments and appliances of interest to physicians and surgeons. Of these, the "Empire" general operation table now being shown at the Scientific Instrument section of the Palace of Industry at the British Empire Exhibition has been designed with a view to getting the utmost strength and rigidity of construction, combined with simplicity in obtaining the various positions required. The base and tilting gear are each formed of one casting; the frame of the top is of seamless steel tubing, all joints being welded. The top is of phosphor-bronze, and other portions of the table liable to wear are made or covered with the same material. The construction ensures absolute rigidity and stability at any height and in any position, the various parts being carefully machined and the screw gears well-fitted. There are no cog-wheel gears in any part to cause shake. The table stands on four bronze feet, which are capable of adjustment for the purpose of levelling; they are shaped so as to render it an easy matter to slide the table along the floor. The height of the table can be altered while the patient is in any position by means of an oil pump actuated by the foot. The range is from 3 ft. 5 in. in its highest to 2 ft. 9 in. in its lowest, the latter allowing of the correct Trendelenburg position. A kidney bridge is an integral part of the table, being actuated by means of a simple lever giving a direct lift without any complicated gear.

A movable lamp for the operating table is fitted with ball-bearing castors. The lamp consists of an upright and an arm six feet long terminating in a group of four lamps with parabolic reflectors giving a shadowless light of approximately 800 candle power; the base is made sufficiently heavy to give good stability.

OPHTHALMIC BENEFIT COMMITTEE.—A meeting of this committee will take place on July 7th, at 5.30 P.M., in the Council Chamber of the British Medical Association.

consideration.—Mr. W. GRAHAM (Financial Secretary to the Treasury) replied: The statements below give the figures asked for in the first two parts of the question. As regards the last part of the question, the revision of the Public Health Acts, which is now under consideration, is intended primarily as a preliminary to consolidation and there is no reason at present to think that any amendments will result in a material addition to the cost of local administration.

STATEMENT A.—The latest available figures as to the expenditure (other than out of loans) by local authorities in England and Wales on public health services (excluding services carried on by local education authorities) relate to the year 1921–22 and are summarised in the following table:—

Services.	Expenditure (other than out of loans).	Sources from which expenditure was met—		
		Specific receipts in aid of the service—		
		Fees, tolls, rents, and other receipts not being grants or rates.	Government grants.*	Rates and other unallocated receipts.
	£	£	£	£
Sewers and sewage disposal	8,918,025	754,299	219,933	7,973,793
Collection and disposal of house refuse ..	7,874,393	457,890	11,185	7,405,318
Scavenging and watering of roads and streets	(Approx.) 4,450,000	Not ascertained.	—	(Approx.) 4,450,000
Hospitals, sanatoria, dispensaries, &c., for Tuberculosis .	3,338,150	472,820	1,936,564	928,766
Venereal dis..	452,639	10,377	407,277	44,985
Fever, diphtheria, smallpox, &c. ..	4,320,877	207,597	4,249	4,109,031
Salaries of M.O.H.'s, inspectors of nuisances, health visitors†	1,345,259	9,796	389,174	946,289
Maternity and child welfare..	2,003,722	472,423	882,556	648,743
Baths, wash-houses, and open bathing places	1,803,912	774,969	11,197	1,017,746
Parks and open spaces	3,920,652	898,064	298,812	2,723,776
Vaccination ..	178,558	—	10,323	163,235
Port sanitary service	104,639	17,701	45,464	41,474
Cemeteries ..	1,463,462	901,989	24,088	537,385
Water-supply .	16,437,690	12,613,969	32,053	3,791,668
Other health services	1,856,497‡	478,861	6,370	1,371,266
—	58,503,000	18,070,000	4,278,000	36,152,000

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* The figures entered under Government grants are in some cases based in expenditure incurred before 1921–22 and *include grants made in respect of schemes of work for the unemployed.* Expenditure in respect of lunatics and lunatic asylums, mental deficiency, Poor-law infirmaries, and other Poor-law institutions for the sick, and housing and town planning is not included above.

† So far as not allocated to specific services.

‡ Includes approximately £15,000 in respect of expenditure on the welfare of the blind.

Public Health Expenditure (Voluntary Agencies).

	Expenditure.	Exchequer share.
Maternity and child welfare ..	£400,000	£230,000
Welfare of the blind	£450,000	£700,000

STATEMENT B.—*National Health Insurance* (calendar year 1922):—

Expenditure	£26,000,000
Exchequer share	7,500,000

STATEMENT C.—*Board of Education School Medical Service* (1922–23):—

Expenditure	£1,234,000
Exchequer share (approximately)	600,000

Surgeon-Commanders' Pensions.

Dr. SPERO asked the Parliamentary Secretary to the Admiralty whether the increased pensions granted to senior surgeon-commanders, Royal Navy, were regarded as a measure of compensation for their compulsory premature retirement; and if they were liable to a reduction with the fall in the cost of living.—Mr. AMMON replied: The earlier ages of compulsory retirement were introduced as a part of the new scheme of pay and allowances, &c., in 1919. This scheme must be considered as a whole and no particular item of it can be regarded as a set-off against another particular item. The answer to the last part of the question is in the affirmative.

TUESDAY, JULY 1ST.

Age Disqualification and Sickness Insurance.

Mr. WILLIAM HENDERSON asked the Minister of Health whether his attention had been drawn to the fact that workmen over 70 years of age who were in employment paid their national health insurance contributions, though they were not eligible for sickness benefit; and whether, seeing that these men were afraid of losing their employment if they disclosed their age, he would include in the terms of reference to the committee of inquiry into the national health insurance the desirability of permitting persons to draw sick benefit irrespective of age, so long as they continued to pay the insurance contributions.—Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is aware of the point raised by my hon. friend. The terms of reference of the Royal Commission would enable the question of the extension of the title to sickness benefit to persons over 70 years of age to be considered.

Remuneration of Army Medical and Veterinary Officers.

Mr. JAMES GARDNER asked the Secretary of State for War whether, seeing that officers of the Army Medical and Veterinary Services who were originally remunerated on a civilian basis were now placed on the army officers' basis, he would take the necessary action to place the emoluments of the officers of the staff for Royal Engineer Services on a military basis; and whether, seeing that the civilian officers of the army chaplain's department, who had always been on the civilian basis, were in 1920 placed on the army officers' basis for retired pay, he would extend the same privilege to the officers of the staff for Royal Engineer Services.—Major ATTLEE (Financial Secretary to the War Office) replied: As regards future entrants, the question of placing their pay and retired pay on a military basis is under consideration. But there is no intention, for the reasons I have already explained, of altering the present basis for the existing permanent officers of the staff for Royal Engineer Services.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Wednesday, Thursday, and Friday, July 9th, 10th, and 11th.

SUB-SECTION OF PROCTOLOGY (Section of Surgery): Annual Clinical Meeting in conjunction with the American Proctologic Society:—

Wednesday.

11 A.M. Reception by the President (Mr. Aslett Baldwin).
Papers:
Dr. Jackson (President, A.P.S.): "Quo vadis?"
Dr. Beach: The Evolution of Proctology.

5.30 P.M.
Discussion:
The Injection Treatment of Hæmorrhoids, to be opened by Mr. Graeme Anderson.

Thursday.

4.30 P.M.
Discussions:
The Treatment of Pruritus Ani, to be opened by Dr. Montague (New York). The Treatment of Rectal Prolapse, to be opened by Dr. Hirschman (Detroit).

Friday.

4.30 P.M.
Discussion:
The Treatment of Cancer of the Rectum, to be opened by Mr. W. Ernest Miles and Mr. Lockhart-Mummery.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, July 7th, to SATURDAY, July 12th.—ROYAL EYE HOSPITAL, Southwark. Clinical Cases daily at 3 P.M. except Saturdays. Mon., 5 P.M., Mr. T. W. Letchworth: Optic Neuritis. Tues., 5 P.M., Mr. W. J. Lindsay: Squint. Wed., 5 P.M., Mr. A. D. Griffith: Conjunctivitis. Thurs., 5 P.M., Mr. T. W. Letchworth: The Treatment of Epiphora and Mucocele. Fri., 5 P.M., Mr. E. A. Dorrell: Glaucoma.—ST. PETER'S HOSPITAL FOR STONE. Clinical Work and Special Lectures Daily (last week).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, July 7th.—11 a.m., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 p.m., Mr. Bishop Harman: Eye Dept.

Tuesday.—10 a.m., Dr. Drummond Robinson: Gynæcological Operations. 11 a.m., Mr. Endean: Venereal Diseases. 2 p.m., Dr. Burrell: Medical Out-patients.

Wednesday.—10 a.m., Dr. Saunders: Medical Diseases of Children. 12.15 p.m., Dr. Burnford: Medical Pathology. 2 p.m., Dr. Owen: Medical Out-patients.

Thursday.—10 a.m., Dr. Grainger Stewart: Neurological Dept. 2 p.m., Mr. Simmonds: Surgical Out-patients. 2 p.m., Mr. Bishop Harman: Eye Dept.

Friday.—10 a.m., Mr. Dudley Buxton: Dental Dept. 2 p.m. Mr. Sinclair: Surgical Out-patients. 2 p.m., Mr. Vlasto: Throat, Nose, and Ear Dept.

Saturday.—9.30 a.m., Dr. Burnford: Bacterial Therapy. 10 a.m., Dr. Saunders: Medical Diseases of Children. 10 a.m., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 a.m. to 6 p.m., Saturdays, 10 a.m. to 1 p.m., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.

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ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.

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Appointments.

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Cobb, G. F., M.R.C.S., L.R.C.P. Lond., Senior Assistant Medical Officer and Deputy Medical Superintendent of the Burntwood County Mental Hospital, near Lichfield, Staffs.

Cubbon, H. T., M.B., B.Ch. Camb., Second Electro-Therapeutist, Royal Sussex County Hospital.

Hobling, J. H., L.M.S.S.A. Lond., Certifying Surgeon under the Factory and Workshop Acts for Lostwithiel.

Lane-Roberts, C. S., M.S. Lond., F.R.C.S. Eng., Obstetric Surgeon to Out-patients, Queen Charlotte's Maternity Hospital.

Rolston, J. R., L.R.C.P. Edin., M.R.C.S., Consulting Ophthalmic Surgeon to the South Devon and East Cornwall Hospital, Plymouth.

Young, A., M.B., C.M. Glasg., one of the Medical Referees under the Workmen's Compensation Act for the County of Lanark.

Vacancies.

For further information refer to the advertisement columns.

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Birmingham, Queen's Hospital.—Surg. Reg. £100.

Blackburn, Calderstones, Whalley.—Asst. M.O. £440 16s. 11d.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—R.M.O.

Coventry and Warwickshire Hospital.—H.P. £150. Also Jun. H.S. £130.

Durham, Richard Murray Hospital, Blackhill.—R.M.O. £400.

Gilbert and Ellice Islands Colony.—Sen. M.O. £650.

Guy's Hospital.—Part-time M.O. in Venereal Dis. Dept. £550.

Guy's Hospital Dental School, London Bridge, S.E.—Sen. Dent. O. and Clin. Tutor. £300.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Gynæcologist.

Hong-Kong University, Faculty of Medicine.—Professor of Obstetrics and Gynæcology. £800.

Hospital for Consumption and Diseases of Chest, Brompton.—R.M.O. and Reg. £500. Also H.P. £50.

Hull City Mental Hospital.—Sen. Asst. M.O., &c. £600.

King's Lynn, West Norfolk Hospital.—Res. Surg. O. £300–£350.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Leicester Royal Infirmary.—H.P. £125.

Liverpool Royal Infirmary.—Hon. Asst. P.

London Hospital.—Second Reg. to Ear, Nose, and Throat Dept.

Margate, Royal Sea Bathing Hospital.—H.S. £200.

Metropolitan Hospital, Kingsland-road, E.—Asst. Dent. S.

Middlesex Hospital, W.—Res. M.O. £250.

Northampton County Mental Hospital, Berrywood, near Northampton.—Locum Tenen's M.O. £8 8s. weekly.

Northampton General Hospital.—Sec. Supt. £400.

Norwich, Norfolk and Norwich Hospital.—Anæsth. £300.

Queen's Hospital for Children, Hackney, E.—Asst. Cas. H.S. £100. Also Asst. S. to Ear, Nose, and Throat Dept.

Royal Army Medical Corps.—20 Commissions.

Royal Chest Hospital, City-road, E.C.—P. to Out-patients.

Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and H.S.

Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—Reg. and Clin. Asst. 100 guineas.

St. Bartholomew's Hospital.—Asst. Administrator of Anæsthetics.

St. Bartholomew's Hospital Medical College.—Demonstrator of Physiology.

St. Mary's Hospital, W.—Cas. H.S. £100.

St. Mary's Infirmary, Highgate-hill.—A.M.O. £350.

St. Thomas's Hospital.—Visiting Anæsth.

Sheffield Children's Hospital.—H.S. £125.

University College Hospital, Gower-street, W.C.—Tub. O. £300.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Ophth. S.

Warrington Infirmary and Dispensary.—Jun. H.S. £175.

West London Hospital, Hammersmith-road, W.—Asst. Anæsth.

Wolverhampton and Staffordshire Hospital.—Pathologist and Bacteriologist. £600.

York City Mental Hospital, Fulford.—Asst. M.O. £440.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Castleton, Yorks, North Riding; and Melling, Lancs.

Births, Marriages, and Deaths.

BIRTHS.

Bowes.—On June 27th, at de Vaux-place, Salisbury, the wife of G. K. Bowes, M.D., M.R.C.P., of a son.

Dunlop.—On June 19th, at Elm Cottage, Hendon, to Dr. Doris Howard, wife of Dr. W. A. L. Dunlop—a daughter.

Girdwood.—On April 18th, at Johannesburg, the wife of Dr. R. L. Girdwood, of a daughter.

Grant.—On June 27th, at York, the wife of Major M. F. Grant, R.A.M.C., of a daughter.

MARRIAGES.

Wilson—Lamport.—On June 24th, at the Parish Church, Lancaster, by the Rev. J. W. N. Bardsley, vicar, assisted by the Rev. J. L. Gamble, vicar of Milnthorpe, Henry Wilson, *M.C.*, M.B., Ch.B., of "Whitmore," Gatley, Cheshire, son of Henry Wilson, M.R.C.S., and Mrs. Wilson, of Cheadle, Cheshire, to Florence Marjorie Lamport, M.B., Ch.B., younger daughter of H. C. Lamport, M.B., C.M., and Mrs. Lamport of Lancaster.

DEATHS.

Dow.—On June 22nd, at Comely Park House, Dunfermline, William Barrie Dow, M.D., F.R.C.S. Edin., LL.D., in his 89th year.

Ferguson.—Robert Bruce Ferguson, M.A., M.D. Cantab., D.P.H., &c., at "Marton" Catherine-road, Surbiton, formerly of New Southgate.

Penny.—On June 22nd, at Liverpool, Dr. Alfred Ferguson Penny, F.R.C.S. Irel., late of Chelsea, in his 59th year.

Stewart.—On June 30th, at Melville-street, Edinburgh, Charles Hunter Stewart, M.B., C.M., D.Sc., Professor of Public Health, University of Edinburgh, aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

A CONVENIENT OPERATION TABLE.

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A movable lamp for the operating table is fitted with ball-bearing castors. The lamp consists of an upright and an arm six feet long terminating in a group of four lamps with parabolic reflectors giving a shadowless light of approximately 800 candle power; the base is made sufficiently heavy to give good stability.

Ophthalmic Benefit Committee.—A meeting of this committee will take place on July 7th, at 5.30 p.m., in the Council Chamber of the British Medical Association.

Notes, Comments, and Abstracts.

CHRONIC LEAD POISONING AMONG POTTERY WORKERS.[1]

BY FRANK SHUFFLEBOTHAM, M.D. CAMB.,
M.R.C.P. LOND.,
MEDICAL ADVISER TO THE NATIONAL SOCIETY OF POTTERY OPERATIVES OF GREAT BRITAIN AND IRELAND.

FOR many years past public attention has been attracted to the number of cases of lead poisoning in the pottery industry of this country, and for more than 20 years I have been closely interested in the medical welfare of the men and women who live in the district in which I was born.

The Potteries of North Staffordshire.

Unfortunately, I cannot submit a favourable report with regard to workers engaged in lead processes. Roughly speaking, there are between 60,000 and 70,000 men, women, and girls employed in the pottery industry in this country, and North Staffordshire can be claimed to be the most important pottery centre in the whole world. There are nearly 5000 employees engaged in processes which expose them to lead poisoning. The pottery industry is not confined to England only; it is, next to agriculture, the oldest handicraft, and has been practised in every country alike in ancient and in modern times, and yet the Staffordshire potter has been able to hold his own for hundreds of years in the markets of the world. What applies to Staffordshire applies also to other pottery districts. There are many counties in England, Scotland, Ireland, and Wales where pottery is produced, and where lead processes are involved, but I wish to confine my remarks principally to lead poisoning as found among lead workers in North Staffordshire. It is estimated that in the North Staffordshire district at the present time there are 2600 working in lead processes, 1300 in lead processes of what is called a low solubility glaze, and 800 in what is assumed to be leadless glaze, and the nature of the employment is as follows: Leadhouse men, 100; dippers and ware cleaners, 1650; glost placers, 1900; glost oddmen, 450; majolica paintresses, 150; groundlayers, 150; aerographers, 300.

The leadless glaze factories are mainly those factories which make electric fittings, stilts and spurs, Longton china, and sanitary fire-clay ware. About 10 per cent. of pottery workers are engaged in lead processes, and although the Home Office figures show a reduction in the incidence of lead-poisoning cases, they do not disclose the real facts. I admit that the various investigations that have been made with regard to this industry have prompted the Home Office to make such regulations as have practically wiped out acute cases of lead poisoning; but when a man has worked in lead for 20 years, even under conditions such as the Home Office has laid down, there is not the slightest doubt his employment has exercised a great detrimental influence on his health and shortened his life by many years. The medical men in North Staffordshire have learnt a great deal through the wise action of Mr. Hugh Worthington Adams, the county coroner for the district, in insisting upon post-mortem examinations being made upon all lead workers, and the information so acquired has shown conclusively that life has been shortened and death accelerated as a result of the men's employment in lead processes. Further, by these examinations a great deal of light has been thrown upon the action of lead and lead salts upon the human system.

The Diagnosis of Lead Poisoning.

Lead poisoning cannot be diagnosed at sight like broken arms and broken legs. In view of the fact that there are now practically no cases of acute lead poisoning, those of chronic lead poisoning require very careful investigation. The symptoms of chronic lead poisoning during life are those of general arterio-sclerosis. There is hypertrophy of the heart, a high blood pressure, and the urine invariably shows a low specific gravity. With regard to albuminuria and casts, these are not invariably present, but with the low specific gravity and frequent micturition, especially during the night, a fairly safe conclusion as to the condition of the kidneys can be formed. Among the lead poisoning cases which have been under my care at the North Staffordshire Infirmary, it has been my practice to have the urine for each day collected and samples examined, and even when there has been no doubt that the patient was suffering from lead poisoning, some days elapse before albumin is found in the urine. The high blood pressure may rise to extraordinary heights. I had recently a patient who had been in bed for two weeks, and whose blood pressure rose to 260 mm. Hg and, strange to say, he recovered. A few days ago I examined a lead worker who had travelled four miles to see me and who was undoubtedly suffering from lead poisoning with a blood pressure equal to 200 mm. Hg. Anæmia is a well-known concomitant of lead poisoning, and the examination of the blood shows a diminished percentage of hæmoglobin and frequent basophilic granulation of the red blood corpuscles.

The subjective symptoms of this complaint are headaches, constipation, vomiting, abdominal colic, pains in the arms and legs, shortness of breath, and giddiness. In some cases there is wrist-drop, but I do not think this symptom is as frequent as it was 20 years ago. In view of the fact that acute cases are now practically non-existent, eye trouble does not occur except as a complication of general arterio-sclerosis. Although many manufacturers now use low solubility glazes, and are thereby reducing the risk of lead poisoning among their operatives, yet low solubility glaze is by no means free from danger, and may itself cause lead poisoning in a marked degree. One reason for this may be that the dust arising from a low solubility glaze is composed of much finer particles than that from the ordinary glaze. One case in particular which has come under my notice recently is that of a young woman who had never worked in an ordinary lead glaze, but who worked for about four or five years in a low solubility glaze. She is undoubtedly suffering from lead poisoning, and is, in fact, now receiving full compensation in respect of it.

Lead poisoning is not an untreatable disease. The experience of the physicians at the North Staffordshire Infirmary shows that even a comparatively short treatment with rest in bed, good diet, and a course of suitable medicine effects a marked improvement in the patient's condition.

Medico-legal Aspects of Lead Poisoning.

The medico-legal aspect of lead poisoning is of extreme importance, because in many cases victims of the industry are deprived of their just rights through the unjust laws of this country as embodied in the Factory Act and the Workmen's Compensation Act. The monthly examination by the certifying factory surgeon has undoubtedly had a great beneficial influence on lead workers, both in the pottery industry and in other industries where lead processes are employed; but, on the other hand, the mere fact that the certifying factory surgeon can suspend a lead worker from his employment (in which he may have been engaged for 30 or 40 years) on the ground that he is unsuited to work in lead processes because he is presumed to be suffering from lead poisoning, is a manifest injustice. Under these circumstances the worker can claim no compensation under the Workmen's Compensation Act. The Workmen's Compensation Act does not act fairly towards lead workers. It has been so worded that county court judges, who sympathise with the workers in these dangerous industries, have been rendered helpless. In any dispute between the worker and the employer as to whether the former is suffering from lead poisoning or not, the case must be submitted to a medical referee appointed by the Home Office before the workman can obtain compensation. I contend that a single examination is not sufficient in cases of suspected chronic lead poisoning to decide the matter in dispute. It very often takes me a week to make a decision in doubtful cases, and in most instances I have found it to be to the benefit of the patient that I have delayed my decision.

Post-mortem Aspects of Lead Poisoning Cases.

I have attended all the post-mortem examinations on lead workers in North Staffordshire for some years past, and the principal features in these examinations have been: (1) hypertrophy of the heart with atheroma of the aorta and the aortic valves; (2) granular and contracted kidneys, with very little cortex; (3) in some instances, cerebral hæmorrhage; (4) rarely, constriction of the large intestine; (5) occasionally, blue line round the anus. (In the last ten years I have only seen a blue line round the gums in three cases.)

In conclusion, I wish to say that I am only anxious that what I regard as the most beautiful industry in this country should be worked under conditions such that the men and women employed in it might lead the healthiest lives.

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[1] A paper read at the First International Congress of the People's League of Health at Wembley on May 23rd, 1924.

A WELL-ORGANISED EXPEDITION.

A FIRST-AID compartment in charge of trained nurses was a feature of each of the eight special trains which conveyed the employees of Boots Pure Drug Co., Ltd., from Nottingham to Wembley on June 21st. Further precautions taken to ensure the comfort of the party included rooms booked in a London hotel for those who might miss trains, and a special fleet of trams and buses to convey to their homes those employees living in country districts. The arrangements were carried out for the directors, who bore all the expenses, by the Boots Welfare Department under Major T. Knowles.

Observations
ON THE
DIAGNOSIS OF DIPHTHERIA:
COMBINED BACTERIOLOGICAL AND CLINICAL EVIDENCE.

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THE investigation described in this paper was made in order to see if laboratory methods, applied as thoroughly as possible to every case admitted with a diagnosis of diphtheria into an infectious fever hospital, would be helpful. In other words, would the extra time and trouble involved in such work give any real help (*a*) in the interests of the patient, (*b*) in the interests of hospital administration?

Procedure.

The patients were admitted to the South-Western Hospital of the Metropolitan Asylums Board. From every patient admitted with a diagnosis of diphtheria a swab was taken in the receiving-room by the medical officer on duty, and a clinical diagnosis made by her and entered in the record as "diphtheria," "probably diphtheria," "not diphtheria," or "probably not diphtheria." The first two groups are considered as a positive admission-room diagnosis of diphtheria, and appear in Table I. as $b+$; the two latter are recorded as a negative admission-room diagnosis, and appear as $b-$. The swab was sent to the Wellcome Physiological Research Laboratories some six miles away, where it was usually received the same day, and sown on Löffler's medium. From the swab a "direct smear" was made, and stained by Gram's method, in order to detect Vincent's organisms or streptococci, if present. After incubation for 18 to 24 hours a smear was made from the culture, and if organisms morphologically indistinguishable from K.L.B. were found, the laboratory diagnosis was entered as "M.D.B." Throughout this paper "M.D.B." is used to indicate bacilli morphologically indistinguishable from the *Bacillus diphtheriæ*; this is essentially a microscopic diagnosis. "K.L.B." is used to indicate a bacillus which microscopically appears to be *B. diphtheriæ*, isolated in pure culture, which ferments glucose but not saccharose, and may be virulent or avirulent to guinea-pigs.

The culture made from the swab on Löffler's medium and allowed to grow overnight was in most cases injected intradermically into guinea-pigs. From the swab or the culture on Löffler's medium plates were always sown, and one or more colonies picked off, grown for 24 hours, and injected intradermically into guinea-pigs.[1] In special cases the subcutaneous method was also used. If the provisional diagnosis made did not agree with the clinical diagnosis, a second swab was asked for. Thus the clinical and laboratory workers each had, while the patient was available, the opportunity of reviewing the diagnosis in view of the other's evidence.

The clinical work fell mainly on Dr. Amy Thoms and Dr. Ruby Inkster; the laboratory work was carried out by Dr. A. J. Eagleton (in the earlier part of the series), and Dr. C. C. Okell, Dr. H. J. Parish, and Miss M. Baxter throughout. From time to time the results were reviewed in conference by the above workers together with ourselves. Since the whole problem was approached from the clinical standpoint, the final decision in all cases rested with the clinician.

Results.

The investigation was carried on until 700 swabs had been examined. They are divided into two series, G, 1 to 600, and A, 1 to 100; 520 patients in all were examined. In Table I. are given the general results. If we consider for the moment series G, 1 to 600, it will be noted that in the case of 58·3 per cent.—i.e., cols. B, F, G, and D—of all patients certified before admission as "bacteriological" or "clinical" diphtheria, the diagnosis was confirmed, while in 41·7 per cent.—i.e., cols. C and E—the original diagnosis could not be confirmed either clinically or bacteriologically. It is not suggested that this whole group represents definite errors in clinical diagnosis made by outside practitioners. Some of these "negative" patients had probably had clinical diphtheria a few days previously, and were "clearing up" when admitted. We must also remember that the general practitioner or the medical officer in a general hospital is often faced with a situation in which he considers it justifiable to send the patient to a fever hospital as a precautionary measure or on grounds of expediency.

TABLE I.—*Showing the General Results of the Examination.*

—	A	B	C	D	E	F	G	H
	Cases	Agreements—		$a+$ $b-$ $c-$	$a-$ $b+$ $c-$	$a+$ $b-$ $c+$	$a-$ $b+$ $c+$	$a-$ $b+$ c ?
		+	−					
G. 1–100	70	45	12	—	12	—	1	—
101–236	106	41	32	5	22	2	4	—
237–456	162	78	34	3	32	11	4	—
457–600	98	47	28	1	10	10	2	—
Total.	436	211 (48·4)	106 (24·3)	9 (2·1)	76 (17·4)	23 (5·3)	11 (2·5)	—
A. 1–100	93	57 (61)	15 (16)	1 (1)	2 (2)	—	10 (11)	8 (9)

a, Laboratory diagnosis. *b*, Admission-room diagnosis. *c*, Final clinical diagnosis.

Col. D: From nine cases virulent bacilli were isolated when the "admission diagnosis" and the final clinical diagnosis were negative. These would seem to be patients who had yielded a "positive" result during the swabbing of contacts or routine swabbing of schools or families. All nine carriers within a few weeks gave a succession of negative swabs. It is worthy of remark that col. D—i.e., the "carriers"—represents only 2 per cent. of the total admissions. We anticipated that most of the cases considered clinically negative by the hospital staff would have fallen into this group, whereas they fall into the group in which both the bacteriological and clinical evidence failed to confirm the diagnosis made before admission.

Col. E: Here the laboratory worker failed to find bacilli in one or more swabs and the clinician made the final diagnosis negative, though on admission the condition of the patient had justified a provisional clinical diagnosis of "probably diphtheria."

Col. G: These 11 cases are of considerable interest; in Table II. are given details.

TABLE II.—*Clinical Diagnosis Positive, but Laboratory Diagnosis Negative in all 11 Cases.*

	No. of cases.
Two negative swabs	1
Three ,, ,, ...	4
Four or more negative swabs..	2
Very few M.D.B.; not isolated	2
Avirulent (several colonies examined) ..	2

The notes from these cases have subsequently been carefully considered in conference; the laboratory workers' evidence in all these instances—i.e., the examination by cultural and inoculation tests—have failed to yield the results which are regularly obtained in frank clinical diphtheria. The clinicians, on the other hand, on reviewing the clinical records, felt that the course of the illness so closely resembled frank clinical diphtheria that a diagnosis of diphtheria was the only one open to them.

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[1] Eagleton and Baxter: Brit. Med. Jour., 1921, i., 775.

The only point of outstanding interest is that in several of these instances the patient was admitted late in the course of a severe attack and received serum at a late stage of the disease; one would have expected some paralytic or myocardial symptoms to appear during convalescence, but this expectation was not realised and in none did these symptoms appear. More than one of these patients was shown to a class of students and a prognosis of paralysis during convalescence made, but no paralysis developed. Clinically, these cases certainly did not resemble syphilitic pharyngitis. It may be that the illness in these patients was caused by Vincent's organisms or streptococci. We are of the opinion that few, if any, of these cases can be thus explained, for we were naturally alive to these possibilities and had examined direct smears in every case.

From two patients avirulent organisms only were isolated. When the result of the virulence test was known some days had elapsed, and the opportunity of getting a second swab at an early stage of the disease had disappeared. The facts relating to these two patients are recorded above; virulent organisms may have also been present in the throat, but the swab either failed to collect any virulent organisms or collected extremely few, which could not be isolated. The few investigations that have been made indicate that probably more than 1 per cent. of the general population in London carry avirulent K.L.B. in their throats. Among 554 patients sent into a hospital one would expect to find a small number carrying avirulent K.L.B., in addition to the causal virulent organisms. The laboratory workers have found, in a total of approximately 2000 examinations in the past few years, three instances of the association of virulent and avirulent K.L.B. in the same culture, one from a healthy carrier, one from a convalescent patient, and one from a case of diphtheria.

The examinations in series A, 1 to 100, were carried out before those in series G, and before the arrangements for rapid interchange of results were working as smoothly as during the later G series. The general results resemble those of series G, except that under cols. G and H 20 per cent. of the patients appear, whereas in series G col. H is unnecessary, and col. G contains only 2·5 per cent. Without emphasising the point too far, we are inclined to believe that, as the general result of this earlier work, the clinician came to feel that the laboratory evidence gave definite aid, and that where the "admission diagnosis" and the laboratory diagnosis did not agree there was a gradually increasing tendency to revise the "admission diagnosis." The results obtained from series A are not represented in the percentages quoted throughout the paper and in the general discussion.

The following points of interest emerged during the inquiry:—

1. In 95·5 per cent. of cases in which the diagnosis of diphtheria was confirmed, the first swab sent to the laboratory was found to be positive, and it is worthy of note that by the technique adopted virulent *B. diphtheriæ* were isolated from 93·5 per cent. (Table III.).

TABLE III.—*Clinical Diagnosis Positive in 245 Cases.*

	Cases.		Percentage.	
First swab positive—				
K.L.B. isolated—Virulent ..	229	234	93·5	95·5
,, ,, —Avirulent ..	2		0·8	
Very few M.D.B. present, not isolated	3		1·2	
Swab negative		11		4·5

2. In five cases in a total of 436—i.e., 1·15 per cent. —later examination changed a negative laboratory diagnosis, which had been based on the examination of the first swab, into a positive diagnosis.

3. Amongst 234 patients where the clinical diagnosis was positive and M.D.B. were seen in the smear, isolation of virulent organisms was successful from the first swab in 231 instances, while in three instances —i.e., 1·2 per cent.—M.D.B. were seen in the first swab but could not be isolated, whereas from a second swab virulent K.L.B. were obtained.

4. Three laryngeal cases occurred in the series; from one virulent K.L.B. were obtained; from two, with a clinical diagnosis "uncertain, ? laryngeal diphtheria," no M.D.B. were obtained in culture.

5. In only two instances the clinical diagnosis was "nasal diphtheria," but from neither were K.L.B. obtained.

6. Amongst 182 cases clinically negative, no M.D.B. were obtained from cultures in 167 instances—i.e., 91·7 per cent.; in 11 instances—i.e., 6 per cent.—very few M.D.B. were seen in the smear made from an overnight culture, but could not be isolated. It is probable that none of these were true K.L.B.

From four only avirulent K.L.B. were isolated. From the cultures obtained from each of these four patients a number of colonies were examined for virulence.

Summary of Results.

1. Approximately 529 patients certified as suffering from diphtheria and admitted to the South-Western Hospital were included in the examination; 436 of them were closely studied. In 59 per cent. the diagnosis of diphtheria was confirmed. In 41 per cent. the diagnosis could not be confirmed.

2. Only nine cases, or approximately 2 per cent. of the whole, were healthy "carriers" of virulent *B. diphtheriæ.*

3. The laboratory workers' diagnosis agreed with the clinical diagnosis in 97·5 per cent. of instances; in 11 cases (2·5 per cent.) the laboratory evidence was directly against a diagnosis of diphtheria, while the clinical evidence was quite definitely in favour. No completely satisfactory explanation of these discrepancies suggests itself.

4. The first swab examination at the laboratory was found to be positive in 95·5 per cent. of instances in which the diagnosis of diphtheria was confirmed. From 93·5 per cent. virulent diphtheria organisms were isolated. In only 1·15 per cent. was a negative diagnosis which had been made from the first swab changed into a positive diagnosis by the examination of later swabs.

5. Two cases only were diagnosed as "nasal diphtheria," but from neither were *B. diphtheriæ* isolated.

Conclusions.

With regard to the questions set forth at the beginning of the inquiry we can answer:—

1. There is no evidence that the information obtained by the inquiry has altered or improved the prognosis or treatment of the patients suffering from diphtheria.

2. From the administrative point of view the inquiry has been justified; we feel that the investigation has resulted in an increased confidence and accuracy of diagnosis amongst the clinicians taking part. It should therefore facilitate the allocation of patients to the different wards in the hospital and ensure their release in "negative" cases at an earlier date than would be justifiable without full coöperation with the laboratory worker.

3. The accuracy of hospital statistics is much improved by the coöperation of the laboratory worker.

4. From the point of view of accuracy of diagnosis, we are definitely of opinion that laboratory facilities similar to those described should be available in all large hospitals for infectious fevers.

The amount of laboratory work was very large, and it is probable that after this preliminary careful exploration of the field information of similar value can continuously be supplied by the laboratory worker, even if he dispenses with the routine animal tests and trusts to isolation and fermentation tests of pure colonies. The true *B. diphtheriæ* invariably and rapidly ferments glucose, but never saccharose. The animal test should be available in doubtful or difficult cases.

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a rate depending on the rapidity of the healing process. At length, after several weeks, the end of the diaphysis shows a normal structure and the previous rickets is only to be detected by the contrast shown between its fine close structure and the coarse-grained appearance of the structure of the bone-shaft.

The *calcium content of the bone* also increases with the beginning of the healing process. This is best shown in the development of the so-called "osteophyte layer" of periosteal fibrous tissue which forms a more or less close sheath around the shaft of the bone. The rate of healing was compared with that of similar cases receiving untreated cod-liver oil (see Wimberger, 1923). In cases of therapy with untreated crude cod-liver oil, the first signs of healing were apparent after about 2–3 weeks (14–24 days); in the present case the period varied from two to five weeks, and especially in regard to the later course of the recovery, the rate of healing in these observations was definitely slower than with untreated cod-liver oil. The course of healing was not observed to differ in any way from that observed in X ray with other therapeutic agents (sunlight or mercury-quartz lamp radiation).

Case Histories.

CASE 1.—F. G., male, aged 6 months. Admitted Feb. 7th, 1923. Child cannot sit alone, skeleton shows swellings at the epiphyses, well-marked rosary, no craniotabes, dimensions of fontanelle 4 by 4·5 cm. Clinical examination otherwise negative, with the exception of rhinitis with a slight pharyngeal murmur. Tuberculin reaction negative. X ray examination showed active rickets in moderate degree. Feb. 8th: Therapy begun with oxidised cod-liver oil, gradually increasing dose from 4 to 20 g. daily of a 50 per cent. emulsion. 12th to 28th: Respiratory infection with middle-ear inflammation and pneumonia. March 1st: Unchanged in X ray. 8th: Normal temperature, increasing in weight, obstinate rhinitis. and bronchitis. X ray shows suggestion of healing at the proximal end of the fibula. 15th: X ray picture shows distinct signs of healing in tibia and fibula. 22nd: Marked improvement in general condition. X ray photograph shows healing of the skeleton to be progressing. 29th to May 10th: X ray shows progressive healing of bone lesions at a slow rate. May 12th: Lungs free, chronic rhinitis. Can sit with support. June 7th: Skeleton shows well-calcified regular ends to the bone-shafts, with wide, thick osteophyte layer; healing almost complete.

CASE 2.—H. M., male, aged 9 months. Admitted Feb. 13th, 1923. Moderately well nourished. Skeleton shows strongly-marked rosary, slight craniotabes with some hydrocephalus, dimensions of the great fontanelle 3 by 3 cm., no teeth, moderate swellings at the joints. X ray shows active rickets of moderate grade, slender bones with well-marked calcium deficiency; the ends of the metaphyses with finely fringed outlines; suggestion of osteophyte layer at radius and ulna. Feb. 14th to April 15th: Preliminary period of observation without special therapy. Child had chicken-pox, but made good recovery and gain in weight. X ray examinations during this period showed bone lesions to have remained unchanged. April 15th: Therapy begun with oxidised cod-liver oil; dose gradually raised to 20 g. daily 50 per cent. emulsion. First attempts to crawl. 24th: X ray picture unchanged. May 1st: First definite signs of healing shown in X ray by deposition of calcium in the distal metaphysis of the ulna. 15th: Good progress in healing of the bone lesions shown in X ray. Acute attack of bronchitis with fever and loss of weight. 24th: Extraordinarily quick progress in the repair of bone lesions. Recovering from bronchitis; gaining in weight. June 19th: Healing of rickets far advanced. 23rd: Discharged.

CASE 3.—E. B., male, aged 5 months. Admitted March 23rd, 1923. Nutrition good, skin clear, œdema present in both feet. Skeleton shows well-marked rosary and severe craniotabes; dimensions of fontanelle 3 by 3·5 cm., no teeth. Chvostek test definite, tendon reflexes increased. Spleen not palpable. Tuberculin test negative. Slight bronchitis. X ray shows active rickets with moderate degree of calcium deficiency; the ends of the shafts are slightly cupped and markedly fringed in outline. March 24th: Frequent attacks of laryngospasmus. April 1st: Therapy began with oxidised cod-liver oil, gradually increasing from 2 to 20 g. daily of a 50 per cent. emulsion. 7th: X ray examination shows no change. The Chvostek sign disappears promptly after doses of 10 per cent. ammonium chloride. Slight increase in body-weight. 14th: Doubtful signs of healing in X ray at proximal ends of tibia and fibula. 21st: Definite healing visible in X ray in femur, tibia, and fibula. 25th: Middle-ear inflammation following a cold infection. 28th: General condition good, putting on weight, can sit with support. X ray shows *deposition* of calcium to be far advanced in the healing metaphyses at the proximal ends of the tibia and fibula, and to a less degree at the distal ends of the ulna, radius, and femur. May 26th: X ray shows healing process to be almost complete. 29th: Discharged.

CASE 4.—A. F., male, aged 12 months. Admitted April 27th, 1923. Child in poor general condition, had recovered from measles one week before admission; very pale and thin. Skeleton shows marked rosary and swollen joints, soft skull with hydrocephalus; *dimensions of the* fontanelle 3 by 3·25 cm.; two teeth. Child has a potbelly, spleen hard and palpable two fingers' breadth below the rib margin; enlarged liver. Bad croupy cough with dyspnœa, action of alæ nasi obvious in breathing, fine râles over the apex of the right lung. Tuberculin test negative. X ray examination shows severe active rickets, with marked calcium deficiency, very coarse structure of spongy bone, the ends of the metaphyses frayed, green-stick fracture of the right fibula. April 27th to June 27th: X ray shows condition of the skeleton to remain unchanged. During this period the child suffered from a severe attack of bronchial pneumonia, making a fair recovery. Severe anæmia with marked splenic enlargement. June 28th: Administration of oxidised cod-liver oil begun. July 4th: Cough and cold infection, fever, severe anæmia (Hb=35, Sahli). 25th: Recovered. X ray photograph shows suggestions of healing at the ends of all metaphyses. August 2nd: Healing definitely apparent in X ray at the distal end of ulna and radius, and at the proximal end of tibia and fibula. The anæmia and general condition better. 15th: Healing shows slow progress. Anæmia slowly improving, spleen unchanged; 1 per cent. solution of tartar emetic given intravenously. Sept. 5th: X ray shows a fresh distinct line of calcification at the epiphyseal end of the wide rachitic zone. Oct. 10th: The ends of the bone-shafts regular in contour. Good general condition, can stand with support. Therapy with *untreated* cod-liver oil begun. Oct. 27th: Discharged. General *condition* good, rachitic bone lesions almost healed.

Conclusions and Summary.

1. Four cases of active rickets in infants, aged from 5 to 12 months, were treated with oxidised cod-liver oil (heated for 24 hours at 120° C. with air bubbled through). The daily dose was 10 g. and the cases, carefully controlled with regular X ray examination, showed satisfactory healing of the bone lesions at a rate rather slower than with the same dose of a potent, crude, untreated cod-liver oil.

2. The growth-promoting potency of the two samples of oil, tested by growth experiments on rats, was found to be in the ratio of about 1 : 20.

3. Assuming that a daily dose of 10 g. untreated cod-liver oil, when used in therapy of rickets, does not provide any great excess of anti-rachitic principle, these observations lend support to the view that cod-liver oil contains two active organic factors: (1) *anti-rachitic* or calcium-depositing, and (2) growth-promoting (vitamin A), and that the latter is the more sensitive to oxidation at a high temperature.

Our thanks are due to Dr. Zilva for kindly supplying the sample of oxidised cod-liver oil, to the Lister Institute for a supply of the purified materials used in the basal diets for the animal experiments, and to the Medical Research Council for a grant in aid and for other help. We want to express special thanks to Miss Harriette Chick, who kindly helped us, not only in the translation, but also by her constant advice and interest in the matter.

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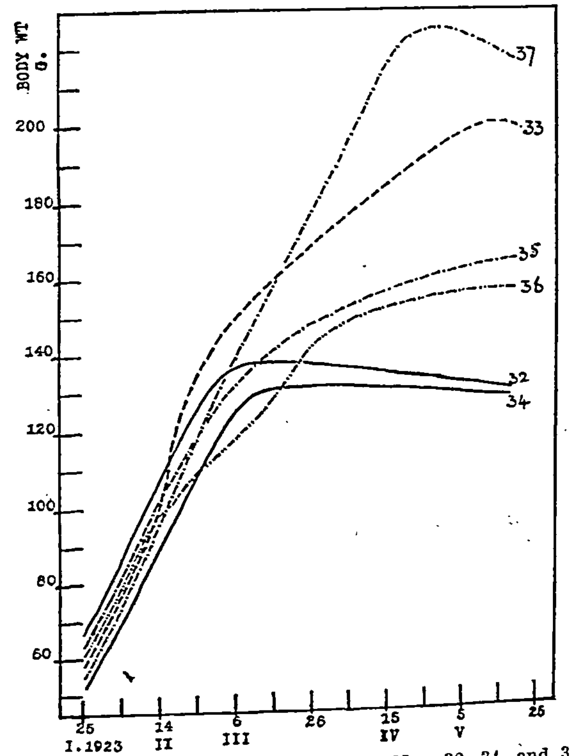
(*Continued at foot of next page.*)

cure, a fact which usually can only be determined after two or three consecutive weekly X ray examinations. The children's diet was for the most part that usual for infants in the clinic; full cows' milk with sugar, and cereal foods prepared with sugar and full milk, lemon-juice or orange-juice being added as anti-scorbutic.

The oxidised cod-liver oil "V.1." was kindly provided for us by Dr. Zilva, of the Lister Institute, London. The oxidation had been carried out at a temperature of 120° C. for 24 hours in a current of oxygen. The oil was tested by means of growth experiments with rats for its content of vitamin A and compared with a potent sample of untreated cod-liver oil. The basal diet employed and the general methods used for these experiments were the same as those used by Hume (1923) in this clinic. Young rats of about 50 g. body-weight were placed upon a diet complete in every respect but deficient in vitamin A. After weight had become stationary, the oil to be tested was added, the daily dose being fed to each rat with a pipette. The weight curves of these animals are given in the accompanying Figs. 1 and 2.

Fig. 1 shows the effect of untreated ("P.C.") and oxidised oil ("V.1."). The three animals receiving the oxidised oil "V.1." had 10 drops daily. At the end of the four months' observation the three animals receiving this oil showed the general symptoms of vitamin-A deficiency: retarded growth, enophthalmus, conjunctivitis, numerous small hæmorrhages on the eyelids, staring coat, discoloured teeth, lethargy, and loss of appetite. In no cases was there actually keratomalacia. A daily ration of 10 drops of the oxidised cod-liver oil was, therefore, not adequate to maintain normal growth and to prevent the effects of vitamin-A deficiency.

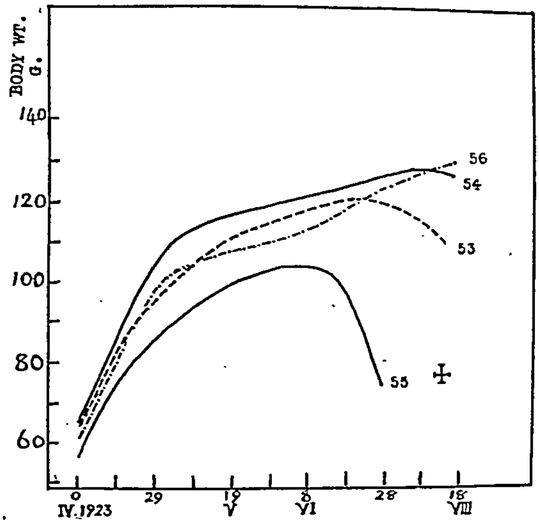
FIG. 1.



Weight curves of rats on "–A" diet. Nos. 32, 34, and 36 received in addition 10 drops daily oxidised cod-liver oil "V.1." Nos. 33, 35, and 37 received 1 drop untreated cod-liver oil "P.C." every second day until March 8th–12th, afterwards 1 drop every day.

The three animals receiving the untreated oil "P.C." had a comparatively small dose: 1 drop every other day for the first six to seven weeks and afterwards 1 drop daily. Nevertheless, their final body-weights were greater than those of the "V.1." animals, and two of the three (Nos. 33 and 37) approached the maximum weight of normal rats at their period of growth. There was no symptom of vitamin deficiency nor any trace of conjunctivitis; and there was a definite accession of growth when the daily dose was increased to a whole drop daily. We calculate, therefore, that the limiting values of the two samples of oil with regard to growth-promotion and prevention of xerophthalmia were, oxidised to untreated, as 1 to 20.

FIG. 2.



Weight curves of rats on "–A" diet. Nos. 53 and 54 received in addition daily 10 drops oxidised cod-liver oil "V.1."

Fig. 2 shows growth curves of two animals, 53 and 54, who received 10 drops oxidised cod-liver oil, "V.1.," daily, in comparison with two other animals, 55 and 56, who received the basal "–A" diet without any addition. The curves show that the oxidised cod-liver oil in the doses used by us may be regarded as free from vitamin A.

The clinical observations were made upon four cases, three moderately severe and one severe, all in the active stage. The X ray signs were unmistakable: very coarse structure of the spongy bone in the shafts, a more or less irregular frayed contour at the ends of the shafts, especially at the more quickly-growing metaphyses, at the distal ends of femur, radius, and ulna; in addition, a general diminution of calcium content markedly demonstrated in the faint shadows given by the centres of ossification.

The *effect of the therapy* was determined by means of X ray photographs which, as was shown by the researches of Chick and co-workers in this clinic (1922, 1923) and by many American observers, not only enables a trustworthy judgment to be made as to the stage of the bone lesions, but also clearly demonstrates all the fine details of the healing process.

The picture of active rickets given above showed no alteration in a preliminary period of about eight weeks' observation without special therapy, in Cases 2 and 4. Only when healing began, after treatment, was a fine cross-way band of shadow visible, several millimetres removed from the frayed end of the shaft, corresponding to the formation of a new preparatory zone of calcification at the end of the uncalcified rachitic tissue which had developed during the period of the active rickets. This new deposition of calcium marks the beginning of normal endochondral ossification and of normal growth in length in the cartilaginous zone. Deposition of calcium then takes place in the area between the new zone of provisional calcification and the end of the shaft, at weaker action, comprises the two Merck cholesterins; and Group III. only a Kahlbaum cholesterin (V.), which was of very low value. Since these investigations thus have shown that different samples of cholesterin may vary considerably, it would perhaps be desirable that each consignment of extract should be accompanied by some of the identical cholesterin which has been used in the estimation of the suspension factor, making it also possible to test the value of the cholesterin to be used. It would, naturally, be best if, by an alteration of the composition of the extract, the reaction could be strengthened, so that the cholesterin could be dispensed with, as proposed by Renaux.[3] This would be of advantage in another way, for, as will be seen from Table II., the strengthening of the reaction which is obtained by the addition of cholesterin is very different for the various sera: if, for instance, Serum No. 2 is strengthened 98 per cent., Serum No. 7 only 38 per cent. of Group I.'s cholesterins, the same sera are strengthened 51 per cent. and 7 per cent. of Group III.'s cholesterins. The addition of cholesterin thus causes a change in the original relative strengths of the various sera.

TABLE I.

Serum No.	Units per c.cm. with cholesterin.							
	Own making.	Kahlbaum.					Merck.	
		I.	II.	III.	IV.	V.	I.	II.
1	85	88	88	85	81	68	77	77
2	81	85	81	81	77	62	68	67
3	50	44	50	47	44	36	43	41
4	39	43	40	39	39	28	31	33
5	10	10	9·7	9·7	9·4	6·7	8·6	8·6
6	9	9·6	9·6	9·4	9·0	6·6	7·7	7·7
7	3·8	4·3	4·2	3·8	3·8	3·1	3·4	3·6
8	2·8	3·1	3·1	2·8	2·8	2·3	2·8	2·5

TABLE II.

Serum No.	Σ Units without cholesterin.	Group I.		Group II.		Group III.	
		Units aver.	Increase.	Units aver.	Increase.	Units aver.	Increase.
			%		%		%
1	59	85	44	77	31	68	16
2	41	81	98	68	66	62	51
3	31	47	57	42	36	36	16
4	25	40	60	32	28	28	12
5	6·2	9·8	58	8·6	39	6·7	9
6	5·5	9·3	69	7·7	40	6·6	20
7	2·9	4·0	38	3·5	21	3·1	7
8	2·0	2·9	45	2·7	35	2·3	15

2. *Closing of Tubes for Rendering Sera Inactive* (S. and S.-G.R.).—Dreyer and Ward direct that the inactivation of the sera should be carried out by isolation in tubes plugged with cotton-wool, since they find that a tightly closed tube (closed with cork or rubber or sealed in flame) often causes a weakening of the reaction, as the process of inactivation takes place under a certain pressure.

If Meinicke's "trübungs" reaction is carried out on the same sera, wadding plugs may often prove unsatisfactory as *even small* pieces of cotton flock in the serum may cause unspecific reactions. In our Institute we therefore used rubber corks until Prof. Dreyer recently drew attention to the fact that this involved the danger mentioned above. The investigation into the importance of this was made in the following way: each serum was divided into two tubes of the same diameter containing an equal quantity, after which one was closed with a plug *of wadding and the* other with a rubber cork. After inactivating in the usual manner the S. and S.-G.R. were carried out on the various serum samples. With the S.R., the result was that this was in some cases weakened by inactivating in tubes with tight rubber corks. As a sum total, 35 sera were examined, and of these the weakening was in: 13 cases 0; 10 cases, 0–10 per cent.; 8 cases, 10–25 per cent.; 4 cases, 25–50 per cent. Sera for the S.R. should therefore be inactivated in tubes closed with a loose plug of cotton-wool and not with cork or rubber.

With the S.-G.R., 20 sera were examined. These were titrated quantitatively (with falling doses of serum). In no case was it possible to determine any weakening of the reaction by inactivating in tubes closed with rubber corks in contrast to tubes closed with a cotton-wool cork. This is probably due to the shorter period of inactivation.

3. *Fluctuations in the Temperature of Inactivation* (S. and S.-G.R.).—In their first report Dreyer and Ward directed that inactivation should be continued for 90 minutes at 53°–54° C. The temperature was raised later[4] to 55°; S.-G.R. inactivates in 30 minutes at 55° C. Six sera were tested, of which a sample was inactivated 90 minutes at 53°, 54°, 55°, 56°, 57° C. respectively. The result of the test is summarised in Table III.

TABLE III.

Serum No.	1		2		3		4		5		6	
C.	Σ u.	S.G.	Σ u.	S.G.	Σ u.	S.G.	Σ u.	S.G.	Σ u.	S.G.	Σ u.	S.G.
53°	155	100	85	50	55	75	15·0	20	3·2	10	2·5	5
54°	155	100	85	50	55	75	15·0	20	3·1	10	2·3	—
55°	148	100	80	50	50	75	13·5	20	2·9	10	1·6	—
56°	128	100	75	50	42	75	10·0	20	2·5	10	0·9	—
57°	85	70	65	50	19	65	6·5	15	1·9	7	0·0	—

Σ u = Σ units.

The table shows that the strength of the S.R. declines with increasing the inactivating temperature, commencing at 54° C., and that the weakening is not proportionate to the temperature, the rate of weakening increasing considerably for every degree the temperature rises. As far as the S.-G.R. is concerned, no perceptible weakening of the reaction was determined until the temperature got beyond 56°; this is presumably due to the rather imperfect quantitative method, which does not permit of the determination of slighter weakening than 25–50 per cent., and also to the fact that the weakening is less with the shorter period of inactivating. It must therefore be strongly advised, especially as regards the S.R., that great care be taken that the temperature of the inactivating water bath is kept absolutely constant.

4. *Nature of the Water Bath* (*Sigma*).—In their work Dreyer and Ward emphasise the importance of carrying out the S.R. in a water bath and not in a dry air incubator, as the latter is said to give much weaker reactions. On the other hand, they do not indicate whether the water bath ought to be closed or open. As in our institute we generally use large, well-insulated water baths with fairly tight lids and containing 60 to 80 litres of water (the temperature thus being kept more constant and dust being kept out), used, for instance, for the W.R., these have until recently been also used for the S.R. During the International Serological Conference mentioned previously, we learned, however, that most investigators (Dreyer and Ward included) had used small open water baths. The experiments mentioned at the commencement of this work (the sending of the same serum samples to various laboratories) and later on the work of the Copenhagen Conference, showed that the values obtained for the S.R. compared with the W.R. were obviously weaker than those found elsewhere. It therefore appeared to me necessary to try whether this could possibly, to any degree, be due to the use of the covered water baths. A number of sera were pipetted in duplicate, one set being placed in a little open water bath, the other in the covered water bath generally used, both of them in such a way that half the liquid in the tubes

SOME FACTORS INFLUENCING THE FLOCCULATION METHODS OF DREYER-WARD AND SACHS-GEORGI.

By I. R. MÖRCH.

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SINCE Dreyer and Ward in 1921 published their quantitative sero-reaction—Sigma reaction (S.R.)[1]—for the diagnosing of syphilis, this has, after a series of experiments made on the initiative of the Hygienic Committee of the League of Nations,[2,3] and the Medical Research Council,[4] been acknowledged in most quarters as an excellent diagnostic reaction, just as sensitive—and perhaps more so—than the various modifications of Wassermann's reaction (W.R.), and of high specificity. Some of the experimenters (Houston, Boyd Campbell, Smyth, Rankin and Hall, Stokes and Wigham,[4] Mörch and Thaysen,[5] Mörch, Boas, Pontoppidan[6]) devoted themselves also to the quantitative side of the reaction, and have accordingly found that the method is sufficiently exact* to enable one to follow the result of treatment. It therefore seemed possible that in the S.R. one might possess a standard reaction which, provided that the reaction was carried out exactly according to the directions, would give fully comparable results in any laboratory whatever; but, as the following shows, this involved greater difficulty than had been expected.

In connexion with the researches instituted by the Hygienic Committee of the League of Nations, a number of syphilitic sera were divided into small portions, placed, sterile, into ampoules and sent out to various laboratories (Drs. Harrison and Wyler, London; Prof. Hirszfeldt, Warsaw; Dr. Renaux, Brussels) where they were examined the same day. The results obtained proved to be far from comparable, as will be seen from the following examples taken from the report on the subject to the Hygienic Committee of the League of Nations[3]:—

No.	Σ Units per c.cm.			
	London.	Warsaw.	*Copenhagen.*	*Brussels.*
21	6·8	5·2	1·8	13·4
29	6·8	5·9	3·0	27
40	8·3	5·6	1·8	27
42	8·3	10·1	3·0	34
52	29·5	53	5·5	>54
58	27·0	237	50	>54

In November–December, 1923, an International Serological Conference was held in Copenhagen at the instance of the Committee of Hygiene of the League of Nations, for the purpose of making comparative examinations into the various methods in use for the sero-diagnosis of syphilis. A number of modifications of W.R. were tested, as well as Meinicke's reaction[3] (modification "D.M."), Sachs-Georgi's reaction (S.-G.R.), the S.R. and Meinicke's "trübungs" reaction. The principal results of the work of the conference were, that all the flocculation reactions were perceptibly inferior as regards sensitivity to several of the Wassermann methods used. As regards the S.R., this created considerable surprise, as most of the members of the conference had already had opportunity to determine the absolute superiority of the S.R. over the Wassermann method used by them.

Investigation into the Importance of Details.

The experiments first mentioned of sending samples of the same serum to various laboratories had shown that—contrary to expectation—quantitatively corresponding results with the † S.R. were not obtained, and later on the work of the international conference showed that this rather unaccountable lack of stability might have considerable influence upon the sensitivity of the reaction. It therefore occurred to me that it might be useful to examine to what degree the S.R. is dependent upon various small details which had hitherto not been closely examined, such as slight fluctuations in the temperature of the water baths used, the use of various kinds of cholesterin, the carrying out of the reaction in an open or a closed water bath, the factor so strongly emphasised by Dreyer and Ward that those parts of the Sigma tubes which contain the liquid must be one-half to two-thirds covered by the water in the water bath. As the weakness of flocculation reactions observed during the International Conference included all these contingencies, the relation of the S.-G.R. to these factors was also included in the examination.

This examination comprised the following points: (1) Use of various kinds of cholesterin; (2) the importance of inactivating serum in tubes closed by rubber corks instead of in tubes plugged with cotton-wool; (3) the importance of slight fluctuations in the temperature at which the serum is rendered inactive; (4) the placing of the tubes in an open or in a closed water bath; (5) the importance of fluctuations in the temperature at which the reaction is begun; (6) the importance of the Sigma tubes being immersed in the water in the manner directed.

In all the examinations the directions given by the respective writers were adhered to exactly in all details. The tests were made in especially carefully calibrated tubes. The calculations of the strength of the Sigma reactions were in all cases made on the average of two readings with flocculations from St+ to tr. as a base. The S.-G.R. was also titrated quantitatively, as there is a 50 per cent. fall in the serum quantity in each successive tube, the strength of the reaction being expressed by the reciprocal value of the lowest serum dose, which gave a certain finely granulated precipitate. As the measured serum doses were pipetted decreasing with 50 per cent. for each tube (largest dose 0·2 c.cm. in total volume 0·75 c.cm.) the accuracy of this value is, however, only approximate.

1. *The Use of Various Kinds of Cholesterin* (*S.R.*).—Eight different samples were tested, one of my own making, five of Kahlbaum's, and two of Merck's. The tests were made so that to the same Sigma extract was added the prescribed quantity of cholesterin and a number of sera titrated quantitatively with the extract-cholesterin suspensions thereby produced as antigen. All the samples of cholesterin were tested at the same time. The results will be found summarised in Tables I. and II. Table I. shows that the cholesterins tested may, according to their action, be divided into three groups: Group I. comprises the four Kahlbaum cholesterins and that of my own making; Group II., which had a rather

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* A number of sera, kept in a frozen state and examined on various days (up to 30–40 times), gave practically identical values on each examination.

† The W.R. and S.-G.R. were examined and the results of these were still less comparable.

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placed in the covered water bath, one in a dry-air incubator, and four in an open water bath. By means of wooden blocks it was arranged that the column of liquid in the tubes of one group was wholly immersed, one was two-thirds immersed, one was half immersed, and one immersed one-third in the water. The result of the experiment will be seen from Table VI., which shows that the weakest reaction took place in the covered water bath; a slightly better result was obtained from the use of the dry-air incubator, there having been some circulation of the liquid in these tubes, produced by the evaporation of the liquid. By being placed in the open water bath, wholly immersed, the reaction is strengthened somewhat, but a really strengthened reaction only appears when the column of liquid in the tubes is only partly immersed in the water. The maximum strength of the reactions was obtained in the tubes where the column of liquid had been *half* immersed; if only one-third of the column of liquid is immersed, the results in some cases are somewhat weaker. It is remarkable that some sera are affected much more than others by this "immersion phenomenon." The average increase of the strength of the reaction is round about 100 per cent.

TABLE VI.

—	Σ units per c.cm. in Serum No.—							
	1	2	3	4	5	6	7	8
Water bath, *closed* ..	42	42	16·3	12·5	6·2	5·5	2·4	2·1
Dry-air incubator ..	54	54	17·2	14·7	6·8	6·8	2·8	2·3
Water bath, *open*—								
Wholly immersed ..	69	55	28	19·2	8·1	6·2	3·8	2·5
2/3 ,, ..	81	70	28	29	16·3	9·0	4·5	3·1
1/2 ,, ..	114	81	37	31	16·3	9·7	4·5	3·5
1/3 ,, ..	114	77	36	31	16·3	9·0	3·1	3·3

Inhibition Zones.

In connexion with the experiments described above a number of observations were made which may serve to establish some of the factors which bring about the formation of the so-called inhibition zones. It has previously been observed that some extracts are more apt to give inhibition zones with some sera than others. Apart from the extract, the following factors may influence these formations: (1) The cholesterin; (2) the temperature of inactivation; (3) the temperature at which the reaction is made; (4) circulation of the liquid in the tubes.

That various kinds of cholesterin to various degrees influence the inhibition zone in some sera will be seen from the following examples:—

Cholesterin.	Tube No.—					
	1	2	3	4	5	6
Kahlbaum II. ..	tr	tr÷	t	t	t−	s−
,, III. ..	s−	s÷	t	t	t−	tr÷
,, I. ..	s÷	t	t	t	t−	tr÷

Inactivating serves to remove the inhibition zones which most sera show in active state or after too brief inactivating. If the inactivating is done, however, at too high a temperature (over 54°–55° C.) the inhibition zone returns, as the following examples show:—

—	Tube No.—							
	1	2	3	4	5	6	7	8
Active ..	0	0	tr	tr÷	s	t−	s÷	tr÷
Inactive—								
1½ at 54 C.	s−	t	t	t	t	t	s÷÷	tr
,, 55 ,,	s−	t−	t	t	t	t	s÷÷	tr
,, 56 ,,	0	tr−	t	t	t	t−	s÷	tr−
,, 57 ,,	0	0	tr	t−	t	t−	s−	tr!

That the temperature at which the reaction is carried out plays an important part in the formation of inhibition zones appears from the following:—

Temp. (C.)	Tube No.—						
	1	2	3	4	5	6	7
35°	0	tr−	tr	tr	tr−	tr−	
36°	tr−	tr	tr÷	t−	tr÷	tr!	
37°	tr−	tr÷	t−	t	t÷	s−	tr!
38°	tr	tr÷	t−	t	t−	s(−)	tr!
39°	tr÷	s−	t	t	t−	s(−)	tr!

Temp. (C.)	Tube No.—							
	1	2	3	4	5	6	7	8
35°	tr−	tr−	tr−	s÷	s−	tr		
37°	tr÷	s÷	t	t	t	t	t−	s−
41·5°	t	t	t	t	t	t	t−	s−

These examples show that the very marked inhibition zone at 35° and 36° C. gradually disappears with increasing temperature and at 39°–41·5° has quite disappeared. This makes it probable that the enormous reduction of the reactive capacity which takes place when the temperature sinks from 37° to 35° is principally due to the formation of an inhibition zone which totally masks the reaction and only produces in a lesser degree a real decrease in the velocity of the reaction.

The importance of a strong circulation in the tubes (adjustment of the water level in the water bath) appears from the following:—

—	Tube No.—					
	1	2	3	4	5	6
Water bath, closed ..	0	tr÷	s÷	s	tr	
Dry-air incubator ..	0	tr÷	t−	s÷	tr÷	
Water bath, open—						
1/1 immersed ..	tr÷	s÷	t−	t−	s−	tr?
2/3 ,, ...	s÷	t	t	t−	s÷	tr
1/2 ,, ...	t	t	t	t	s÷	tr

Conclusions.

1. Various specimens of cholesterins, even from the same makers, are not identical with regard to their ability to strengthen the S.R.

2. Inactivation of sera for the S.R. in tubes closed with rubber or cork or sealed in the flame may sometimes bring about some weakening of the reaction. In the case of the S.-G.R. this could not be established.

3. Even slight variations in the temperature at which inactivation is carried out will influence the strength of both the S.R. and the S.-G.R. The rate of the weakening of the strength of the serum is greatly increased for every degree that the temperature is raised above 54° C.

4. When the S.R. is carried out in a closed water bath, a much weaker reaction is obtained than when an open water bath is used.

5. Fluctuations in the temperature at which the S.R. and S.-G.R. are made have a very great influence upon the result of the reaction. In the case of the S.R., temperatures *below* 37° C. are fatal; in the S.-G.R., the same is the case with temperatures *above* 37·5° C.

6. It is of the greatest importance that the adjustment of the water-level in the water bath, so strongly emphasised by Dreyer and Ward, should be exactly adhered to.

7. A number of different factors can give rise to the formation of inhibition zones.

Bibliography.

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18 sera reacted equally in both water baths.
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9 ,, ,, 10–25 %
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} more strongly in the open than in the covered bath.
15 ,, ,, positively (1·6–2·8 units) in the open bath and negatively in the covered bath.

Thus, about 84 per cent. of the sera tested reacted more strongly in the open than in the covered water bath. The difference was so great (in 36 per cent. of the cases more than 100 per cent.) that this alone can explain the rather poor result obtained with the S.R. during the conference in Copenhagen in 1923.

As to the cause of the phenomenon it is impossible to say anything definite, but the explanation is probably the increase in the degree of flocculation (from tr to t) which occurs on placing the reaction an an open water bath, in contrast to a covered water bath, as the result of an increased circulation of the liquid in the tubes. This again is governed by the difference between the temperature of the water bath and the temperature of the air, measured at the height of the upper edge of the liquid in the Sigma tubes. The difference between the temperature of the water bath and the temperature of the air above it was taken on a series of days and was ascertained to be 0·2°–0·4° C. for the covered water bath; whereas for the open water bath the temperature of the air fluctuated during the course of the 24 hours between 22° and 30°, so that the difference here amounted to 8°–15°. The temperature of the liquid in the tubes was about 37°.

5. *Fluctuations in the Temperature at which the Reaction is Carried Out.*—For both the S.R. and the S.-G.R. the temperature at which the reaction is to be carried out is fixed at 37° C., but it may sometimes happen that external circumstances may produce fluctuations in the temperature of shorter or longer duration, and as there are not, as far as I know, any investigations into the importance of this factor, I felt it might be useful to examine to what degree the reactions in question are sensitive to slight deviations from the prescribed temperature.

(*a*) *Sigma Reaction.*—The course of the reaction was examined at the following temperatures: 35°, 36°, 37°, 38°, 39°, and 41·5° C. For each serum all temperatures were examined simultaneously. The results are summarised in Table IV., and it will be seen that the S.R. is extremely sensitive to even very slight fluctuations in temperature.

TABLE IV.

Temp. (C.)	Σ units per c.cm. in serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35°	25	2·3	0·9	1·7	8·8	0·7	8·8	4·4	1·4	2·5	0·9	1·8	0·7	1·6	0·7
36°	—	31	28	31	34	16	—	—	—	3·1	2·8	—	1·7	—	1·3
37°	220	76	68	62	50	43	28	16·4	14	7·7	7·7	6·4	3·0	2·3	2·0
38°	—	85	76	72	65	44	—	—	—	8·1	7·7	—	3·4	—	2·2
39°	—	85	81	72	65	44	—	—	—	8·5	7·7	—	3·8	—	2·3
41·5	220	—	—	—	—	—	28	17·2	13	—	—	—	—	2·5	—

The reaction was certainly affected to a very slight degree by rising temperature—indeed, as far as some of the sera were concerned no difference could be shown in the strength of the reaction carried out at temperatures from 37° to 41·5° C.; on the other hand, if the temperature sinks below 37° C. it is quite another matter, as the capacity to react is already considerably weakened at 36° C., and at 35° C. all the sera react very weakly, and a large number not at all. It will also be seen from the table that the various sera are not equally sensitive to fluctuations in the temperature; for instance, Serum No. 3 gives 0·9 units per c.cm. at 35° and 81 units per c.cm. at 39° C., whilst No. 10 gives 2·5 and 8·5 units respectively. At 35° C. spontaneous flocculation often appears (from tr– to tr+), and likewise one often comes across several consecutive tubes with the same rather weak precipitation (inhibition zones). The calculation of the strength of the serum in units is in these cases not wholly reliable. As a basis for the calculation the tube which shows the greatest precipitation is always chosen, for instance, 1) 0, 2) tr–, 3) tr+, 4) tr–, 5) tr– = 3·8 units per c.cm.

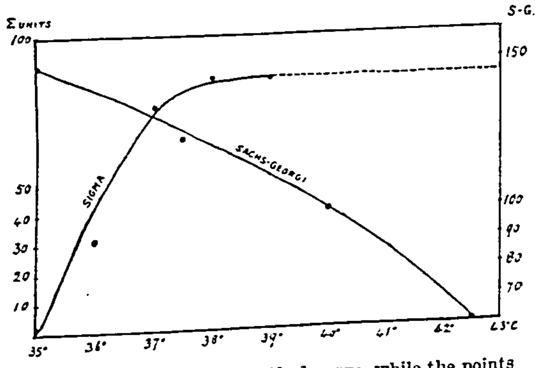
This enormous reduction of the titre of the serum at temperatures below 37° C. is, however, hardly solely due to any real decrease in the speed of the reaction, but rather to the fact that at the low temperatures marked inhibition zones appear so that the reaction is masked, as is seen from some experiments which are described later.

(*b*) *Sachs-Georgi Reaction.*—As it was impossible, the method of quantitative titrating being employed, to observe slight fluctuations in the strength of the reaction, only the following temperatures were tested: 35°, 37·5°, 40°, 42·5° C. All tests were placed in an electrically-heated and regulated incubator, and a control was kept with a maximum and minimum thermometer as to whether the temperature had remained constant during the experiment. The results of the experiment will be found in Table V.,

TABLE V.

Temp. (C.)	Serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35·0°	150	100	40	40	40	30	30	30	30	20	20	15	15	15	15
37·5°	125	100	40	20	30	30	30	30	30	20	20	15	15	12	12
40·0°	100	65	20	10	20	15	20	20	25	10	10	10	5	10	5
42·5°	60	35	10	5	10	5	10	7	15	5	5	5	0	5	0

from which it appears that the S.-G.R., in contrast to the S.R., goes well at 35° C., and that an increase of the temperature from 35° to 37·5° C. in some cases causes a slight weakness, but is generally without influence; if the temperature is raised from 37·5° to 40° C., this causes a considerable decrease in the strength of reaction, and this grows with increasing rapidity with every degree by which the temperature rises; at 42·5° C. most of the sera react negatively, or only slightly positively (±with 0·1 c.cm. serum). The S.R. and the S.-G.R. are thus both influenced by fluctuations in the temperature, but in diametrically opposite directions, as is clearly shown by the graph. What the cause of this may be has not yet been determined.



The lines represent the smoothed curve, while the points represent the actual observations.

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placed in the covered water bath, one in a dry-air incubator, and four in an open water bath. By means of wooden blocks it was arranged that the column of liquid in the tubes of one group was wholly immersed, one was two-thirds immersed, one was half immersed, and one immersed one-third in the water. The result of the experiment will be seen from Table VI., which shows that the weakest reaction took place in the covered water bath; a slightly better result was obtained from the use of the dry-air incubator, there having been some circulation of the liquid in these tubes, produced by the evaporation of the liquid. By being placed in the open water bath, wholly immersed, the reaction is strengthened somewhat, but a really strengthened reaction only appears when the column of liquid in the tubes is only partly immersed in the water. The maximum strength of the reactions was obtained in the tubes where the column of liquid had been *half* immersed; if only one-third of the column of liquid is immersed, the results in some cases are somewhat weaker. It is remarkable that some sera are affected much more than others by this "immersion phenomenon." The average increase of the strength of the reaction is round about 100 per cent.

TABLE VI.

—	Σ units per c.cm. in Serum No.—							
	1	2	3	4	5	6	7	8
Water bath, *closed* ..	42	42	16·3	12·5	6·2	5·5	2·4	2·1
Dry-air incubator ..	54	54	17·2	14·7	6·8	6·8	2·8	2·3
Water bath, *open*—								
Wholly immersed ..	69	55	28	19·2	8·1	6·2	3·8	2·5
2/3 ,, ..	81	70	28	29	16·3	9·0	4·5	3·1
1/2 ,, ..	114	81	37	31	16·3	9·7	4·5	3·5
1/3 ,, ..	114	77	36	31	16·3	9·0	3·1	3·3

Inhibition Zones.

In connexion with the experiments described above a number of observations were made which may serve to establish some of the factors which bring about the formation of the so-called inhibition zones. It has previously been observed that some extracts are more apt to give inhibition zones with some sera than others. Apart from the extract, the following factors may influence these formations: (1) The cholesterin; (2) the temperature of inactivation; (3) the temperature at which the reaction is made; (4) circulation of the liquid in the tubes.

That various kinds of cholesterin to various degrees influence the inhibition zone in some sera will be seen from the following examples:—

Cholesterin.	Tube No.—					
	1	2	3	4	5	6
Kahlbaum II. ..	tr	tr +	t	t	t −	s −
,, III. ..	s −	s +	t	t	t −	tr +
,, I. ..	s +	t	t	t	t −	tr +

Inactivating serves to remove the inhibition zones which most sera show in active state or after too brief inactivating. If the inactivating is done, however, at too high a temperature (over 54°–55° C.) the inhibition zone returns, as the following examples show:—

—	Tube No.—							
	1	2	3	4	5	6	7	8
Active ..	0	0	tr	tr +	s	t −	s +	tr +
Inactive—								
1½ at 54 C.	s +	t	t	t	t	t	s + +	tr
,, 55 ,,	s −	t −	t	t	t	t	s + +	tr
,, 56 ,,	0	tr +	t	t	t	t −	s +	tr −
,, 57 ,,	0	0	tr	t −	t	t −	s −	tr?

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Temp. (C.)	Tube No.—						
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37°	tr −	tr +	t −	t	t +	s −	tr?
38°	tr	tr +	t −	t	t −	s(−)	tr?
39°	tr +	s −	t	t	t −	s(−)	tr?

Temp. (C.)	Tube No.—							
	1	2	3	4	5	6	7	8
35°	tr −	tr −	tr −	s +	s −	tr		
37°	tr +	s +	t	t	t	t	t −	s −
41·5°	t	t	t	t	t	t	t −	s −

These examples show that the very marked inhibition zone at 35° and 36° C. gradually disappears with increasing temperature and at 39°–41·5° has quite disappeared. This makes it probable that the enormous reduction of the reactive capacity which takes place when the temperature sinks from 37° to 35° is principally due to the formation of an inhibition zone which totally masks the reaction and only produces in a lesser degree a real decrease in the velocity of the reaction.

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Water bath, closed ..	0	tr +	s +	s	tr	
Dry-air incubator ..	0	tr +	t −	s +	tr +	
Water bath, open—						
1/1 immersed ..	tr +	s +	t −	t −	s −	tr?
2/3 ,, ...	s +	t	t	t −	s +	tr
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Conclusions.

1. Various specimens of cholesterins, even from the same makers, are not identical with regard to their ability to strengthen the S.R.

2. Inactivation of sera for the S.R. in tubes closed with rubber or cork or sealed in the flame may sometimes bring about some weakening of the reaction. In the case of the S.-G.R. this could not be established.

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37°	220	76	68	62	50	43	28	16·4	14	7·7	7·7	6·4	3·0	2·3	2·0
38°	—	85	76	72	65	44	—	—	—	8·1	7·7	—	3·4	—	2·2
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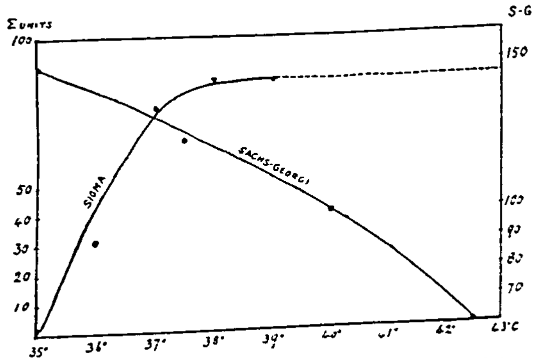

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,, III. ..	s −	s ÷	t	t	t −	tr +
,, I. ..	s ÷	t	t	t	t −	tr ÷

Inactivating serves to remove the inhibition zones which most sera show in active state or after too brief inactivating. If the inactivating is done, however, at too high a temperature (over 54°–55° C.) the inhibition zone returns, as the following examples show:—

—	Tube No.—							
	1	2	3	4	5	6	7	8
Active ..	0	0	tr	tr ÷	s	t −	s ÷	tr ÷
Inactive—								
1½ at 54° C.	s ÷	t	t	t	t	t	s ÷ ÷	tr
,, 55 ..	s −	t −	t	t	t	t	s ÷ ÷	tr
,, 56 ..	0	tr ÷	t	t	t	t −	s ÷	tr −
,, 57 ..	0	0	tr	t −	t	t −	s −	tr?

That the temperature at which the reaction is carried out plays an important part in the formation of inhibition zones appears from the following:—

Temp. (C.)	Tube No.—						
	1	2	3	4	5	6	7
35°	0	tr −	tr	tr	tr −	tr −	
36°	tr −	tr	tr +	t −	tr ÷	tr?	
37°	tr −	tr ÷	t −	t	t ÷	s −	tr?
38°	tr	tr ÷	t −	t	t −	s(−)	tr?
39°	tr ÷	s −	t	t	t −	s(−)	tr?

Temp. (C.)	Tube No.—							
	1	2	3	4	5	6	7	8
35°	tr −	tr −	tr −	s +	s −	tr		
37°	tr ÷	s +	t	t	t	t	t −	s −
41·5°	t	t	t	t	t	t	t −	s −

These examples show that the very marked inhibition zone at 35° and 36° C. gradually disappears with increasing temperature and at 39°–41·5° has quite disappeared. This makes it probable that the enormous reduction of the reactive capacity which takes place when the temperature sinks from 37° to 35° is principally due to the formation of an inhibition zone which totally masks the reaction and only produces in a lesser degree a real decrease in the velocity of the reaction.

The importance of a strong circulation in the tubes (adjustment of the water level in the water bath) appears from the following:—

—	Tube No.—					
	1	2	3	4	5	6
Water bath, closed ..	0	tr ÷	s ÷	s	tr	
Dry-air incubator ..	0	tr ÷	t −	s +	tr ÷	
Water bath, open—						
1/1 immersed ..	tr ÷	s ÷	t −	t −	s −	tr?
2/3 ,, ...	s ÷	t	t	t −	s +	tr
1/2 ,, ...	t	t	t	t	s ÷	tr

Conclusions.

1. Various specimens of cholesterins, even from the same makers, are not identical with regard to their ability to strengthen the S.R.

2. Inactivation of sera for the S.R. in tubes closed with rubber or cork or sealed in the flame may sometimes bring about some weakening of the reaction. In the case of the S.-G.R. this could not be established.

3. Even slight variations in the temperature at which inactivation is carried out will influence the strength of both the S.R. and the S.-G.R. The rate of the weakening of the strength of the serum is greatly increased for every degree that the temperature is raised above 54° C.

4. When the S.R. is carried out in a closed water bath, a much weaker reaction is obtained than when an open water bath is used.

5. Fluctuations in the temperature at which the S.R. and S.-G.R. are made have a very great influence upon the result of the reaction. In the case of the S.R., temperatures *below* 37° C. are fatal; in the S.-G.R., the same is the case with temperatures *above* 37·5° C.

6. It is of the greatest importance that the adjustment of the water-level in the water bath, so strongly emphasised by Dreyer and Ward, should be exactly adhered to.

7. A number of different factors can give rise to the formation of inhibition zones.

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6. Mörch, Boas, Pontoppidan: Archiv f. Dermatologie und Syphilis.

was submerged in the water. Altogether, 110 sera were tested in this manner. The result was that—

18 sera reacted equally in both water baths.
3 ,, ,, 0–10 %
9 ,, ,, 10–25 %
11 ,, ,, 25–50 %
29 ,, ,, 50–100 % } more strongly in the open than in the covered bath.
19 ,, ,, 100–200 %
4 ,, ,, 200–400 %
2 ,, ,, 500 %
15 ,, ,, positively (1·6–2·8 units) in the open bath and negatively in the covered bath.

Thus, about 84 per cent. of the sera tested reacted more strongly in the open than in the covered water bath. The difference was so great (in 36 per cent. of the cases more than 100 per cent.) that this alone can explain the rather poor result obtained with the S.R. during the conference in Copenhagen in 1923.

As to the cause of the phenomenon it is impossible to say anything definite, but the explanation is probably the increase in the degree of flocculation (from tr to t) which occurs on placing the reaction an an open water bath, in contrast to a covered water bath, as the result of an increased circulation of the liquid in the tubes. This again is governed by the difference between the temperature of the water bath and the temperature of the air, measured at the height of the upper edge of the liquid in the Sigma tubes. The difference between the temperature of the water bath and the temperature of the air above it was taken on a series of days and was ascertained to be 0·2°–0·4° C. for the covered water bath; whereas for the open water bath the temperature of the air fluctuated during the course of the 24 hours between 22° and 30°, so that the difference here amounted to 8°–15°. The temperature of the liquid in the tubes was about 37°.

5. *Fluctuations in the Temperature at which the Reaction is Carried Out.*—For both the S.R. and the S.-G.R. the temperature at which the reaction is to be carried out is fixed at 37° C., but it may sometimes happen that external circumstances may produce fluctuations in the temperature of shorter or longer duration, and as there are not, as far as I know, any investigations into the importance of this factor, I felt it might be useful to examine to what degree the reactions in question are sensitive to slight deviations from the prescribed temperature.

(*a*) *Sigma Reaction.*—The course of the reaction was examined at the following temperatures: 35°, 36°, 37°, 38°, 39°, and 41·5° C. For each serum all temperatures were examined simultaneously. The results are summarised in Table IV., and it will be seen that the S.R. is extremely sensitive to even very slight fluctuations in temperature.

TABLE IV.

Temp. (C.)	Σ units per c.cm. in serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
35°	25	2·3	0·9	1·7	8·8	0·7	8·8	4·4	1·4	2·5	0·9	1·8	0·7	1·6	0·7
36°	—	31	28	31	34	16	—	—	—	3·1	2·8	—	1·7	—	1·3
37°	220	76	68	62	50	43	28	16·4	14	7·7	7·7	6·4	3·0	2·3	2·0
38°	—	85	76	72	65	44	—	—	—	8·1	7·7	—	3·4	—	2·2
39°	—	85	81	72	65	44	—	—	—	8·5	7·7	—	3·8	—	2·3
41 5	220	—	—	—	—	—	28	17·2	13	—	—	—	—	2·5	—

The reaction was certainly affected to a very slight degree by rising temperature—indeed, as far as some of the sera were concerned no difference could be shown in the strength of the reaction carried out at temperatures from 37° to 41·5° C.; on the other hand, if the temperature sinks below 37° C. it is quite another matter, as the capacity to react is already considerably weakened at 36° C., and at 35° C. all the sera react very weakly, and a large number not at all. It will also be seen from the table that the various sera are not equally sensitive to fluctuations in the temperature; for instance, Serum No. 3 gives 0·9 units per c.cm. at 35° and 81 units per c.cm. at 39° C., whilst No. 10 gives 2·5 and 8·5 units respectively. At 35° C. spontaneous flocculation often appears (from tr– to tr+), and likewise one often comes across several consecutive tubes with the same rather weak precipitation (inhibition zones). The calculation of the strength of the serum in units is in these cases not wholly reliable. As a basis for the calculation the tube which shows the greatest precipitation is always chosen, for instance, 1) 0, 2) tr–, 3) tr+, 4) tr–, 5) tr– = 3·8 units per c.cm.

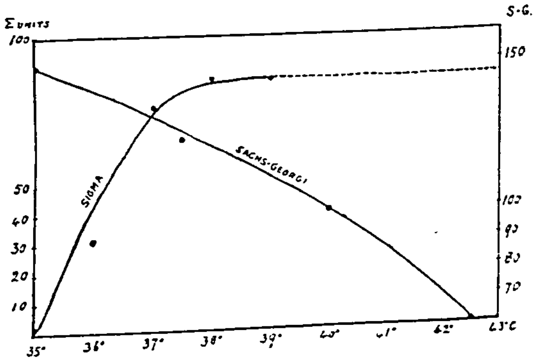
This enormous reduction of the titre of the serum at temperatures below 37° C. is, however, hardly solely due to any real decrease in the speed of the reaction, but rather to the fact that at the low temperatures marked inhibition zones appear so that the reaction is masked, as is seen from some experiments which are described later.

(*b*) *Sachs-Georgi Reaction.*—As it was impossible, the method of quantitative titrating being employed, to observe slight fluctuations in the strength of the reaction, only the following temperatures were tested: 35°, 37·5°, 40°, 42·5° C. All tests were placed in an electrically-heated and regulated incubator, and a control was kept with a maximum and minimum thermometer as to whether the temperature had remained constant during the experiment. The results of the experiment will be found in Table V.,

TABLE V.

Temp. (C.)	Serum No.—														
	1	2	3	4	5	6	7	8	9	10	11	12	13	11	15
35·0°	150	100	40	40	40	30	30	30	30	20	20	15	15	15	15
37·5°	125	100	40	20	30	30	30	30	30	20	20	15	15	12	12
40·0°	100	65	20	10	20	15	20	20	25	10	10	10	5	10	5
42·5°	60	35	10	5	10	5	10	7	15	5	5	5	0	5	0

from which it appears that the S.-G.R., in contrast to the S.R., goes well at 35° C., and that an increase of the temperature from 35° to 37·5° C. in some cases causes a slight weakness, but is generally without influence; if the temperature is raised from 37·5° to 40° C., this causes a considerable decrease in the strength of reaction, and this grows with increasing rapidity with every degree by which the temperature rises; at 42·5° C. most of the sera react negatively, or only slightly positively (±with 0·1 c.cm. serum). The S.R. and the S.-G.R. are thus both influenced by fluctuations in the temperature, but in diametrically opposite directions, as is clearly shown by the graph. What the cause of this may be has not yet been determined.



The lines represent the smoothed curve, while the points represent the actual observations.

6. *Immersion of Sigma Tubes in the Water Bath.*—Dreyer and Ward state in their paper that it is very important to arrange the level of the water in the bath so that not more than the lower half to two-thirds of the column of fluid in the tubes is immersed. But perhaps it might be of interest to determine the exact importance of this point. Of a number of sera several sets were pipetted, one of which was

placed in the covered water bath, one in a dry-air incubator, and four in an open water bath. By means of wooden blocks it was arranged that the column of liquid in the tubes of one group was wholly immersed, one was two-thirds immersed, one was half immersed, and one immersed one-third in the water. The result of the experiment will be seen from Table VI., which shows that the weakest reaction took place in the covered water bath; a slightly better result was obtained from the use of the dry-air incubator, there having been some circulation of the liquid in these tubes, produced by the evaporation of the liquid. By being placed in the open water bath, wholly immersed, the reaction is strengthened somewhat, but a really strengthened reaction only appears when the column of liquid in the tubes is only partly immersed in the water. The maximum strength of the reactions was obtained in the tubes where the column of liquid had been *half* immersed; if only one-third of the column of liquid is immersed, the results in some cases are somewhat weaker. It is remarkable that some sera are affected much more than others by this "immersion phenomenon." The average increase of the strength of the reaction is round about 100 per cent.

TABLE VI.

—	Σ units per c.cm. in Serum No.—							
	1	2	3	4	5	6	7	8
Water bath, *closed* ..	42	42	16·3	12·5	6·2	5·5	2·4	2·1
Dry-air incubator ..	54	54	17·2	14·7	6·8	6·8	2·8	2·3
Water bath, *open*—								
Wholly immersed ..	69	55	28	19·2	8·1	6·2	3·8	2·5
2/3 ,, ..	81	70	28	29	16·3	9·0	4·5	3·1
1/2 ,, ..	114	81	37	31	16·3	9·7	4·5	3·5
1/3 ,, ..	114	77	36	31	16·3	9·0	3·1	3·3

Inhibition Zones.

In connexion with the experiments described above a number of observations were made which may serve to establish some of the factors which bring about the formation of the so-called inhibition zones. It has previously been observed that some extracts are more apt to give inhibition zones with some sera than others. Apart from the extract, the following factors may influence these formations: (1) The cholesterin; (2) the temperature of inactivation; (3) the temperature at which the reaction is made; (4) circulation of the liquid in the tubes.

That various kinds of cholesterin to various degrees influence the inhibition zone in some sera will be seen from the following examples:—

Cholesterin.	Tube No.—					
	1	2	3	4	5	6
Kahlbaum II. ..	tr	tr +	t	t	t −	s −
,, III. ..	s −	s +	t	t	t −	tr +
,, I. ..	s +	t	t	t	t −	tr +

Inactivating serves to remove the inhibition zones which most sera show in active state or after too brief inactivating. If the inactivating is done, however, at too high a temperature (over 54°–55° C.) the inhibition zone returns, as the following examples show:—

—	Tube No.—							
	1	2	3	4	5	6	7	8
Active ..	0	0	tr	tr +	s	t −	s +	tr +
Inactive—								
1½ at 54° C.	s +	t	t	t	t	t	s + +	tr
,, 55 ,,	s −	t −	t	t	t	t	s + +	tr
,, 56 ,,	0	tr +	t	t	t	t −	s +	tr −
,, 57 ,,	0	0	tr	t −	t	t −	s −	tr?

That the temperature at which the reaction is carried out plays an important part in the formation of inhibition zones appears from the following:—

Temp. (C.)	Tube No.—						
	1	2	3	4	5	6	7
35°	0	tr −	tr	tr	tr −	tr −	
36°	tr −	tr	tr +	t −	tr +	tr?	
37°	tr −	tr +	t −	t	t +	s −	tr?
38°	tr	tr +	t −	t	t −	s(−)	tr?
39°	tr +	s −	t	t	t −	s(−)	tr?

Temp. (C.)	Tube No.—							
	1	2	3	4	5	6	7	8
35°	tr −	tr −	tr −	s +	s −	tr		
37°	tr +	s +	t	t	t	t	t −	s −
41·5°	t	t	t	t	t	t	t −	s −

These examples show that the very marked inhibition zone at 35° and 36° C. gradually disappears with increasing temperature and at 39°–41·5° has quite disappeared. This makes it probable that the enormous reduction of the reactive capacity which takes place when the temperature sinks from 37° to 35° is principally due to the formation of an inhibition zone which totally masks the reaction and only produces in a lesser degree a real decrease in the velocity of the reaction.

The importance of a strong circulation in the tubes (adjustment of the water level in the water bath) appears from the following:—

—	Tube No.—					
	1	2	3	4	5	6
Water bath, closed ..	0	tr +	s +	s	tr	
Dry-air incubator ..	0	tr +	t −	s +	tr +	
Water bath, open—						
1/1 immersed ..	tr +	s +	t −	t −	s −	tr?
2/3 ,, ...	s +	t	t	t −	s +	tr
1/2 ,, ...	t	t	t	t	s +	tr

Conclusions.

1. Various specimens of cholesterins, even from the same makers, are not identical with regard to their ability to strengthen the S.R.

2. Inactivation of sera for the S.R. in tubes closed with rubber or cork or sealed in the flame may sometimes bring about some weakening of the reaction. In the case of the S.-G.R. this could not be established.

3. Even slight variations in the temperature at which inactivation is carried out will influence the strength of both the S.R. and the S.-G.R. The rate of the weakening of the strength of the serum is greatly increased for every degree that the temperature is raised above 54° C.

4. When the S.R. is carried out in a closed water bath, a much weaker reaction is obtained than when an open water bath is used.

5. Fluctuations in the temperature at which the S.R. and S.-G.R. are made have a very great influence upon the result of the reaction. In the case of the S.R., temperatures *below* 37° C. are fatal; in the S.-G.R., the same is the case with temperatures *above* 37·5° C.

6. It is of the greatest importance that the adjustment of the water-level in the water bath, so strongly emphasised by Dreyer and Ward, should be exactly adhered to.

7. A number of different factors can give rise to the formation of inhibition zones.

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ON AN IMPROVED PROPHYLACTIC METHOD OF TREATMENT OF ECLAMPSIA.[1]

BY PROF. B. B. STROGANOFF,
LENINGRAD.

AT the Battle of Trafalgar the British navy lost 1690 men, killed and wounded, whereas, according to Thomas Watts Eden, during the period of ten years from 1910 to 1920 there died through eclampsia in Great Britain and Ireland on the average 630 mothers per annum (22·5 per cent. of the cases) and double this number of children (47·8 per cent.). In other words, the loss of human lives during this period from eclampsia was higher than in that great battle.

It appears that in America the mortality from eclampsia is still greater. Leighton states that the death-rate in nine of the chief gynæcological institutions for five years reached 38·4 per cent. Rickets states that in U.S.A. 4000 mothers die annually of eclampsia, whilst, according to Coles Stricker, the average number of cases in that country amounts to 7500 per annum. If these figures are correct, the mortality reaches the enormous figure of 53·5 per cent. Hammerschlag also points out that the mortality from eclampsia in the United States is higher than in Europe. Whereas, in Paris, Berlin, Budapest, and Milan the mortality from eclampsia was about 1 to each 1000 deaths amongst women, in Chicago the proportion was 1·9, in San Francisco 2·9, and in New Orleans even 6·4 among the whites and 3·4 among the coloured population. There is reason to believe that the application of the improved prophylactic method of treatment of this disease will diminish the mortality by at least half.

History of the Method.

I first applied the method detailed later in 1897 and had no deaths from eclampsia in the first 57 cases. At the International Congresses in Paris (1900) and in Rome (1902) I reported 92 and 126 cases of eclampsia respectively with a mortality of 5 to 6 per cent. In 1907 I visited Rosthorn's clinic in Heidelberg and successfully treated a case who had had 11 fits in the course of 9½ hours and coma, with a pulse-rate of 150. Excellent results were obtained by me in 1909 in the clinics of Profs. Schauta and Piscacek (in Vienna), and in 1911 in the clinics of Profs. Bumm and Franz (Berlin). In 1908 I was able to report on 360 cases of eclampsia with a maternal mortality of 6·6 per cent. and a child mortality of 21·6 per cent. (the latter being eclampsias sub partu). Prof. Leopold, in Dresden, first applied my method in 1909, and obtained excellent results on 50 patients, out of which only four with complications died; 34 per cent. had no fits from the moment when treatment began, whilst 50 per cent. had only one to three fits.

The second to adopt my method in Germany was Prof. Krönig in Freiburg, whose five cases of eclampsia were completely satisfactory both as regards the mothers and the children. Since then this method spread further in Germany, in Switzerland (Herff), in Holland (Mingelen), in Sweden (Forssner), and even in the far Argentine (Enricque Zarate).

In 1918 I was able to collect from the literature—which is far from complete—2208 cases of eclampsia treated by this method and its variations, with a total maternal mortality of 9·8 per cent. Amongst 878 children born from eclamptic mothers, whose history is recorded, the mortality after treatment by this method was about 12 per cent. lower than in cases treated by other methods in the same clinics. Acting on behalf of Prof. Hinselmann, Dr. Weinsenfels discovered 1094 more cases up to 1924, which raises the number of cases to *3302, of which 357—i.e., 10·8 per cent.—terminated fatally.*

Still better results were obtained by us during the last 10–12 years after the method was somewhat modified. Out of 253 cases of eclampsia with fits at the State Clinical Institute of Obstetrics and Gynæcology (during 9½ years), and the Krassovsky Lying-in Hospital (from 1910 to 1921, when it was closed) only six deaths—i.e., 2·4 per cent.—were observed. In three of these cases we were dealing with hopeless patients. In one case we were unable to apply the prophylactic treatment in the absence of chloral hydrate, and in two cases of relatively light eclampsia death resulted from pneumonia and septicæmia. Thus, we had not a single death from eclampsia in cases that had not been neglected, and obtained figures regarding which Dr. Fürst[2] justly remarks: "In the statistics of the whole literature these favourable results stand out unsurpassed."

The Secondary Effects of the Treatment.

The beneficent effect of this treatment is confirmed by a series of other facts.

Thus, (1) *the number of fits diminished markedly.* In the course of the last ten years we obtained immediate cessation of the fits after the treatment was commenced in 40 per cent. of cases. In 45 per cent. the fits were repeated from one to three times, and only in 15 per cent. they were more numerous.

(2) *There is a large number of "intercurrent" eclampsias—i.e., cases in which there is freedom from fits for 12 hours and more before delivery.* Formerly, there were from 21 to 27 per cent. of such cases in prophylactic treatment. In the last group treated they amounted to 40·9 per cent. These figures do not, however, sufficiently characterise the power of the method in checking the fits, since many eclamptic patients are delivered in less than 12 hours after cessation of the fits. The efficacy of the method is more distinctly exhibited in cases of eclampsia sub graviditate; since 1916 66 per cent. of such eclampsias manifested an intercurrent course. This is a great advantage, since the pregnancy progresses after cessation of the fits and the child is delivered mature.

(3) *Psychical disturbances* are few in number and of a mild character. Out of 253 cases of eclampsia there were only four—i.e., 1·6 per cent. In one case the patient had five fits and after delivery suffered from nephritis, when mild symptoms of psychosis were observed for some days. In another patient, who had only one fit sub graviditate in the post-partum period, symptoms of icterus gravis were observed, in connexion with which psychosis was observed for several days. Recovery followed.

(4) *The mortality of children is relatively favourable.* For the whole group it amounts to 14·3 per cent., for eclampsia sub partu et sub graviditate 20 per cent., and for post-partum cases 6·2 per cent. The most interesting group for us are the eclampsias ante partum and intra-partum, since in these the action of the drugs upon the fœtus is manifested. The mortality in this group was 20·1 per cent., but if the premature children (weighing less than 2000 g.), which died before treatment was commenced, from cold, operation, &c., are excluded, there remain only 6 per cent. attributable to eclampsia and treatment. And since 6·2 per cent. of fœtuses also perished in post-partum eclampsias, very little remains to the share of drugs.

(5) For the whole group of 253 eclampsias there was not a single death of the mother due to treatment. As is known, in the method of treatment of eclampsia by forced delivery some mothers die as the result of operation. In Bumm and Franz's cases about 4 per cent. of women died in consequence of operation.

(6) Diminution in the number of operative deliveries. These amounted to 56 per cent.

(7) Few cases of pneumonia.—4 in 253 patients.

(8) Rapid recovery of the patients.

On the basis of these 253 eclampsias, as well as of the analysis of the preceding 570 cases treated by the less perfect variety of the prophylactic method, I have arrived at the conclusion that a favourable prognosis can be given for the mother in cases of eclampsia that have not been neglected.

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[1] Being a paper read at the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on July 3rd, 1924.

[2] Zentralbl. f. gynäk., 1924, No. 16, 843.

An extremely interesting confirmation of this is presented by the immense monograph on eclampsia by Prof. Hinselmann, of Bonn, in collaboration with 12 other specialists. He praises highly the great efficiency of this method, and points out that if my figures are achieved by others using my method the problem of the treatment of eclampsia may be regarded as solved. One may hope that the British and American cases of eclampsia are not more intractable than the Russian and German ones.

Proposals for trial in England.

I would like to verify the method in this country and possibly improve the details; at the same time it is my desire to collect the 47 cases to make up a total of 300 treated by this method.

1. The first condition necessary for a trial of my method would be to give me the opportunity of taking part in the treatment of as many cases of eclampsia occurring during the next 1½–2 months of my sojourn in London, as possible. The authorities could perhaps select four or five lying-in institutions in London and request their directors to provide me with the necessary material. It is important to provide for this purpose a separate hygienic room.

2. The exact application of the method is only possible with the help of an experienced qualified assistant who has a knowledge of the method. It is also necessary to have a midwife capable of looking after the eclamptic patient according to the requirements of the method. If a nurse is available, she also should be instructed accordingly. If it were possible to choose these persons beforehand, I would speak to them and instruct them in the technical part of the process. Of course, it is important to have the necessary medicaments and instruments always ready (morphine, chloral, chloroform, oxygen, digitalis, instruments for venesection and for delivery).

3. I consider the demand of T. W. Eden that eclampsias should be classified as mild, severe, and moribund to be very important. To the seven features by which he characterises the severe cases I would add the following two—nephritis of long duration and fits recurring four or more times during two hours. It would seem to me desirable to establish another category of severe cases; those manifesting two-thirds of the symptoms of severity should be referred to as morituræ, or very severe cases, with an additional symptom—*presence of cerebral hæmorrhage.*

4. Considering the importance of this experiment not only in England but in all civilised countries, it would be desirable to establish a special committee for the exact estimation and observation of the cases. Such a committee would naturally be composed of the directors of the lying-in departments of the coöperating institutions, presided over by a person selected by the Section of Obstetrics and Gynæcology of the Royal Society of Medicine.

I am prepared to present myself to take part in the treatment of cases by day and by night.

The Scheme of the Method.

The following is the brief scheme of the method of treatment which is more fully described elsewhere.[3]

Eclamptic patients in most cases die from the destructive action of the fits upon the heart, respiratory centre, &c. Therefore the fits must be repressed. Eclampsias sub graviditate and eclampsias sub partu are treated with equal energy. Post-partum eclampsias have a milder course, and therefore in most cases require the administration of smaller doses of narcotics. Sometimes they are extremely severe and then require maximum doses. During the fits the patient should be protected against injuries, the tongue protected against bites, and oxygen should be given after fits to remove asphyxia. Chloroform is harmful in typical fits, but if the patient is breathing (clonic convulsions) it is useful.

1. *Removal of all irritations:* (*a*) All noise to be eliminated, (*b*) room darkened, (*c*) examinations reduced to a minimum, (*d*) if possible, separate room and constant observation. Transfer to room under chloroform.

2. *Administration of narcotics:* Morphine and chloral hydrate according to scheme below.

The beginning of treatment: ¼ gr. (⅙–⅓ gr.) morph. hyd. hypodermically. 1 hour: 30 gr. (38–22 gr.) chlor. hydr. per os or per rectum. 3 hours from the beginning of the treatment: from ¼ gr. (⅙–⅓ gr.) morph. hyd. hypodermically. 7 hours: As at 1 hour. 13 hours: 22 gr. (15–30 gr.) chlor. hydr. 21 hours: 22 gr. (15–30 gr.) chlor. hydr. Dose increased in severe eclampsia in the case of strong individuals, and diminished in mild forms. When patient is conscious chloral hydrate is introduced per os, and in unconscious condition per rectum with milk and physiological salt solution. During the first two intervals we *frequently administer* chloroform 10–20 minims in the presence of prodromata of a fit. On the second day undelivered patients receive 15–22 gr. chlor. hydr. t.i.d. In the absence of fits during 14 hours and when the patient is in good condition the dosage may be diminished.

3. If the fit recurs *two to three times*, or even once in severe form, in spite of administration of morphine and chloral hydrate, it is necessary to perform venesection, drawing off 400 c.cm. of blood. This is not resorted to if delivery is expected within the next 1–2 hours.

4. As soon as the eclamptic patient can be delivered without harm to herself and child, delivery is undertaken, either with forceps, by extraction, or rarely, by version. In the absence of contra-indications we rupture the bag of membranes, if the os has dilated to two fingers in a multipara, and about three fingers in a primipara.

5. *Maintenance of regular functions of chief organs*:—

(*a*) Kidneys and skin: Patient kept warm with hot water bottles at the feet and in the region of the kidneys; hot tea diluted with milk should be given; unconscious patients must have milk and physiological salt solution āā (about 1000 c.c. per diem), usually with chloral hydrate, per rectum.

(*b*) Lungs: Oxygen after a fit, pure warm air, removal of all hindrances to respiratory movements: unconscious eclamptic patients should be kept chiefly on the right side; careful cleansing of the mouth and nose from mucus, blood, and vomited matter.

(*c*) Heart: Administration of fluids (see (*a*)), when weakened after numerous fits—digitalis (if the pulse-rate is 110 or higher)—and when the heart is still weaker—camphor, caffein. Patients admitted from outside after six or more fits immediately undergo narcotic treatment and venesection. Continuous observation of patient and child during the first 24 hours after delivery. In very severe cases 135 gr. chlor. hydr. and ¾ gr. morph. hyd. are introduced in the course of 14 hours (the administration of narcotics is *much more frequent than* is shown in the scheme, until the fits cease) ÷ chloroform narcosis several times. The forerunners of a fit are: increase of headache (which is recognisable in unconscious patients by the expression of the face, restlessness in bed), convulsive contractions, dimming of vision, and especially *increase of* blood pressure.

I may express my confidence that all the light cases of eclampsia will recover if the method is applied in the proper manner; the severe cases also should not prove fatal provided they do not contract pneumonia or sepsis. If this experiment resulted in the saving of even a few lives I would consider myself perfectly satisfied. It will, however, be of still greater benefit in the future.

In conclusion, I would like to express my deep gratitude to the Society for its willingness to render assistance in the elucidation of a problem which has hitherto produced so few results, in spite of the work of numerous scientists during two centuries.

ANÆSTHESIA FOR SHORT OPERATIONS ON CHILDREN.

BY O. STUART THOMPSON, L.R.C.P. LOND.,
CLIN. ASSIST., OUT-PATIENTS, AND LATE ASSISTANT CASUALTY OFFICER, HOSPITAL FOR SICK CHILDREN, GT. ORMOND-ST., LONDON.

THE choice of an anæsthetic must always rest with the anæsthetist who takes the responsibility of administering it, and in the case of an adult a skilled administrator will employ any of the usual anæsthetics with equal safety and without injurious effects to the patient afterwards. With children the matter is rather different.

When working in the out-patient department of the Hospital for Sick Children, Great Ormond-street, I particularly noticed two post-operative or, as I am inclined to believe, post-anæsthetic conditions: (1) An undesirable amount of collapse immediately following

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[3] Journal of Obstetrics and Gynæcology of the British Empire, Vol. 30, No. 1, 1923.

ON AN IMPROVED PROPHYLACTIC METHOD OF TREATMENT OF ECLAMPSIA.[1]

BY PROF. B. B. STROGANOFF,
LENINGRAD.

AT the Battle of Trafalgar the British navy lost 1690 men, killed and wounded, whereas, according to Thomas Watts Eden, during the period of ten years from 1910 to 1920 there died through eclampsia in Great Britain and Ireland on the average 630 mothers per annum (22·5 per cent. of the cases) and double this number of children (47·8 per cent.). In other words, the loss of human lives during this period from eclampsia was higher than in that great battle.

It appears that in America the mortality from eclampsia is still greater. Leighton states that the death-rate in nine of the chief gynæcological institutions for five years reached 38·4 per cent. Rickets states that in U.S.A. 4000 mothers die annually of eclampsia, whilst, according to Coles Stricker, the average number of cases in that country amounts to 7500 per annum. If these figures are correct, the mortality reaches the enormous figure of 53·5 per cent. Hammerschlag also points out that the mortality from eclampsia in the United States is higher than in Europe. Whereas, in Paris, Berlin, Budapest, and Milan the mortality from eclampsia was about 1 to each 1000 deaths amongst women, in Chicago the proportion was 1·9, in San Francisco 2·9, and in New Orleans even 6·4 among the whites and 3·4 among the coloured population. There is reason to believe that the application of the improved prophylactic method of treatment of this disease will diminish the mortality by at least half.

History of the Method.

I first applied the method detailed later in 1897 and had no deaths from eclampsia in the first 57 cases. At the International Congresses in Paris (1900) and in Rome (1902) I reported 92 and 126 cases of eclampsia respectively with a mortality of 5 to 6 per cent. In 1907 I visited Rosthorn's clinic in Heidelberg and successfully treated a case who had had 11 fits in the course of 9½ hours and coma, with a pulse-rate of 150. Excellent results were obtained by me in 1909 in the clinics of Profs. Schauta and Piscacek (in Vienna), and in 1911 in the clinics of Profs. Bumm and Franz (Berlin). In 1908 I was able to report on 360 cases of eclampsia with a maternal mortality of 6·6 per cent. and a child mortality of 21·6 per cent. (the latter being eclampsias sub partu). Prof. Leopold, in Dresden, first applied my method in 1909, and obtained excellent results on 50 patients, out of which only four with complications died; 34 per cent. had no fits from the moment when treatment began, whilst 50 per cent. had only one to three fits.

The second to adopt my method in Germany was Prof. Krönig in Freiburg, whose five cases of eclampsia were completely satisfactory both as regards the mothers and the children. Since then this method spread further in Germany, in Switzerland (Herff), in Holland (Mingelen), in Sweden (Forssner), and even in the far Argentine (Enricque Zarate).

In 1918 I was able to collect from the literature—which is far from complete—2208 cases of eclampsia treated by this method and its variations, with a total maternal mortality of 9·8 per cent. Amongst 878 children born from eclamptic mothers, whose history is recorded, the mortality after treatment by this method was about 12 per cent. lower than in cases treated by other methods in the same clinics. Acting on behalf of Prof. Hinselmann, Dr. Weinsenfels discovered 1094 more cases up to 1924, which raises the number of cases to *3302, of which 357—i.e., 10·8 per cent.—terminated fatally.*

Still better results were obtained by us during the last 10–12 years after the method was somewhat modified. Out of 253 cases of eclampsia with fits at the State Clinical Institute of Obstetrics and Gynæcology (during 9½ years), and the Krassovsky Lying-in Hospital (from 1910 to 1921, when it was closed) only six deaths—i.e., 2·4 per cent.—were observed. In three of these cases we were dealing with hopeless patients. In one case we were unable to apply the prophylactic treatment in the absence of chloral hydrate, and in two cases of relatively light eclampsia death resulted from pneumonia and septicæmia. Thus, we had not a single death from eclampsia in cases that had not been neglected, and obtained figures regarding which Dr. Fürst[2] justly remarks: "In the statistics of the whole literature these favourable results stand out unsurpassed."

The Secondary Effects of the Treatment.

The beneficent effect of this treatment is confirmed by a series of other facts.

Thus, (1) *the number of fits diminished markedly.* In the course of the last ten years we obtained immediate cessation of the fits after the treatment was commenced in 40 per cent. of cases. In 45 per cent. the fits were repeated from one to three times, and only in 15 per cent. they were more numerous.

(2) *There is a large number of "intercurrent" eclampsias—i.e., cases in which there is freedom from fits for 12 hours and more before delivery.* Formerly, there were from 21 to 27 per cent. of such cases in prophylactic treatment. In the last group treated they amounted to 40·9 per cent. These figures do not, however, sufficiently characterise the power of the method in checking the fits, since many eclamptic patients are delivered in less than 12 hours after cessation of the fits. The efficacy of the method is more distinctly exhibited in cases of eclampsia sub graviditate; since 1916 66 per cent. of such eclampsias manifested an intercurrent course. This is a great advantage, since the pregnancy progresses after cessation of the fits and the child is delivered mature.

(3) *Psychical disturbances* are few in number and of a mild character. Out of 253 cases of eclampsia there were only four—i.e., 1·6 per cent. In one case the patient had five fits and after delivery suffered from nephritis, when mild symptoms of psychosis were observed for some days. In another patient, who had only one fit sub graviditate in the post-partum period, symptoms of icterus gravis were observed, in connexion with which psychosis was observed for several days. Recovery followed.

(4) *The mortality of children is relatively favourable.* For the whole group it amounts to 14·3 per cent., for eclampsia sub partu et sub graviditate 20 *per cent.*, and for post-partum cases 6·2 *per cent.* The most interesting group for us are the eclampsias ante partum and intra-partum, since in these the action of the drugs upon the fœtus is manifested. The mortality in this group was 20·1 per cent., but if the premature children (weighing less than 2000 g.), which died before treatment was commenced, from cold, operation, &c., are excluded, there remain only 6 per cent. attributable to eclampsia and treatment. And since 6·2 per cent. of fœtuses also perished in post-partum eclampsias, very little remains to the share of drugs.

(5) For the whole group of 253 eclampsias there was not a single death of the mother due to treatment. As is known, in the method of treatment of eclampsia by forced delivery some mothers die as the result of operation. In Bumm and Franz's cases about 4 per cent. of women died in consequence of operation.

(6) Diminution in the number of operative deliveries. These amounted to 56 per cent.

(7) Few cases of pneumonia.—4 in 253 patients.

(8) Rapid recovery of the patients.

On the basis of these 253 eclampsias, as well as of the analysis of the preceding 570 cases treated by the less perfect variety of the prophylactic method, I have arrived at the conclusion that a favourable prognosis can be given for the mother in cases of eclampsia that have not been neglected.

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[1] Being a paper read at the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on July 3rd, 1924.

[2] Zentralbl. f. gynäk., 1924, No. 16, 843.

An extremely interesting confirmation of this is presented by the immense monograph on eclampsia by Prof. Hinselmann, of Bonn, in collaboration with 12 other specialists. He praises highly the great efficiency of this method, and points out that if my figures are achieved by others using my method the problem of the treatment of eclampsia may be regarded as solved. One may hope that the British and American cases of eclampsia are not more intractable than the Russian and German ones.

Proposals for trial in England.

I would like to verify the method in this country and possibly improve the details; at the same time it is my desire to collect the 47 cases to make up a total of 300 treated by this method.

1. The first condition necessary for a trial of my method would be to give me the opportunity of taking part in the treatment of as many cases of eclampsia occurring during the next $1\frac{1}{2}$–2 months of my sojourn in London, as possible. The authorities could perhaps select four or five lying-in institutions in London and request their directors to provide me with the necessary material. It is important to provide for this purpose a separate hygienic room.

2. The exact application of the method is only possible with the help of an experienced qualified assistant who has a knowledge of the method. It is also necessary to have a midwife capable of looking after the eclamptic patient according to the requirements of the method. If a nurse is available, she also should be instructed accordingly. If it were possible to choose these persons beforehand, I would speak to them and instruct them in the technical part of the process. Of course, it is important to have the necessary medicaments and instruments always ready (morphine, chloral, chloroform, oxygen, digitalis, instruments for venesection and for delivery).

3. I consider the demand of T. W. Eden that eclampsias should be classified as mild, severe, and moribund to be very important. To the seven features by which he characterises the severe cases I would add the following two—nephritis of long duration and fits recurring four or more times during two hours. It would seem to me desirable to establish another category of severe cases; those manifesting two-thirds of the symptoms of severity should be referred to as morituræ, or very severe cases, with an additional symptom—*presence of cerebral hæmorrhage.*

4. Considering the importance of this experiment not only in England but in all civilised countries, it would be desirable to establish a special committee for the exact estimation and observation of the cases. Such a committee would naturally be composed of the directors of the lying-in departments of the coöperating institutions, presided over by a person selected by the Section of Obstetrics and Gynæcology of the Royal Society of Medicine.

I am prepared to present myself to take part in the treatment of cases by day and by night.

The Scheme of the Method.

The following is the brief scheme of the method of treatment which is more fully described elsewhere.[3]

Eclamptic patients in most cases die from the destructive action of the fits upon the heart, respiratory centre, &c. Therefore the fits must be repressed. Eclampsias sub graviditate and eclampsias sub partu are treated with equal energy. Post-partum eclampsias have a milder course, and therefore in most cases require the administration of smaller doses of narcotics. Sometimes they are extremely severe and then require maximum doses. During the fits the patient should be protected against injuries, the tongue protected against bites, and oxygen should be given after fits to remove asphyxia. Chloroform is harmful in typical fits, but if the patient is breathing (clonic convulsions) it is useful.

1. *Removal of all irritations:* (*a*) All noise to be eliminated, (*b*) room darkened, (*c*) examinations reduced to a minimum, (*d*) if possible, separate room and constant observation. Transfer to room under chloroform.

2. *Administration of narcotics:* Morphine and chloral hydrate according to scheme below.

The beginning of treatment: $\frac{1}{4}$ gr. ($\frac{1}{6}$–$\frac{1}{3}$ gr.) morph. hyd. hypodermically. 1 hour: 30 gr. (38–22 gr.) chlor. hydr. per os or per rectum. 3 hours from the beginning of the treatment: from $\frac{1}{4}$ gr. ($\frac{1}{6}$–$\frac{1}{3}$ gr.) morph. hyd. hypodermically. 7 hours: As at 1 hour. 13 hours: 22 gr. (15–30 gr.) chlor. hydr. 21 hours: 22 gr. (15–30 gr.) chlor. hydr. Dose increased in severe eclampsia in the case of strong individuals, and diminished in mild forms. When patient is conscious chloral hydrate is introduced per os, and in unconscious condition per rectum with milk and physiological salt solution. During the first two intervals we frequently administer chloroform 10–20 minims in the presence of prodromata of a fit. On the second day undelivered patients receive 15–22 gr. chlor. hydr. t.i.d. In the absence of fits during 14 hours and when the patient is in good condition the dosage may be diminished.

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THE choice of an anæsthetic must always rest with the anæsthetist who takes the responsibility of administering it, and in the case of an adult a skilled administrator will employ any of the usual anæsthetics with equal safety and without injurious effects to the patient afterwards. With children the matter is rather different.

When working in the out-patient department of the Hospital for Sick Children, Great Ormond-street, I particularly noticed two post-operative or, as I am inclined to believe, post-anæsthetic conditions: (1) An undesirable amount of collapse immediately following such minor operations as dissection of tonsils, &c.; (2) a fear of the doctor afterwards.

From the anæsthetist's point of view, children may be divided into two classes: (*a*) Those who take the anæsthetic quietly, and (*b*) those who will not take it unless it is forced on them. The first class includes those children who are very ill, and, though it used to be taught that "children take gas badly," it will be found by experience that they take gas and oxygen well. It is now given almost as a routine at the Hospital for Sick Children in cases of hypertrophic pyloric stenosis, and the results of operation in these cases are encouragingly successful. It is a form of anæsthesia that might be more frequently employed for children.

It is the second class of child that I particularly wish to consider. The anæsthetist who also does private practice will have the opportunity to study the after-effects of anæsthesia on children, and if he has to treat the children afterwards, he must soon realise the harm caused by the administration of an anæsthetic through shock and the subsequent fear of the doctor; this is sometimes so great that it is almost impossible to do anything with the child for a year or more.

To avoid these two after-results, I consider the most important thing to do is to shorten the period of induction. The drug that produces anæsthesia most rapidly is ethyl chloride, and this, followed up with ether, I believe to be the best form of anæsthetic for these children at present. It was said to me by a well-known anæsthetist that a drug that produces anæsthesia so rapidly must *ipso facto* be a dangerous drug to use. In the hands of an indifferent administrator this is doubtless true; but experience teaches us everything, and in a series of 10,000 administrations of ethyl chloride given in our dental department no bad effects were noticed. On the strength of this, I used ethyl chloride followed by open ether in a series of 200 cases in the out-patient theatre without observing any ill-effects or alarming symptoms or having any difficulty in the administration.

I give ethyl chloride on an open mask, the amount used being about 3 c.cm. for a child of 5 years old. It is sprayed on the mask, which is immediately applied over the face and is followed by open ether later on. The child is instructed to blow it away, and four "blows" with the inspirations that accompany them are usually sufficient to produce loss of consciousness. The child seldom struggles, and even if it does there is no prolonged induction period—the time being only a few seconds—and consequently there is little recollection afterwards of the struggle with the anæsthetist, and less fear of "the doctor," so that one can still do something with the child again.

It is quite possible to get a child under the anæsthetic rapidly with open ether, but it means "pushing" the anæsthetic, and anyone who has had the experience of breathing with a large amount of ether on the mask knows how extremely unpleasant it is. I can vouch for this from personal experience. With the avoidance of a prolonged induction period, I have noticed less shock following short operations. This shock, in the case of such short operations as are done in an out-patient theatre, I am therefore inclined to regard as post-anæsthetic rather than as post-operative.

The question of administration of an anæsthetic to a child is not complete without reference to the handling of the child and the obtaining of the child's confidence. This is just as important for the anæsthetist as for the physician. Children should never be forced to lie down suddenly, it nearly always frightens them, and if the mask is clapped over the face and ether forced on to them, it is long before they recover their confidence in a doctor. If the anæsthetist had to treat these frightened children he would realise the importance of the careful handling of a child.

As regards chloroform, I do not intend to enter into any discussion as to its comparative merits, or to resuscitate the tedious ether-versus-chloroform controversy. I give children chloroform when necessary, and will admit that it produces a gentle anæsthesia, but I have never liked it for children.

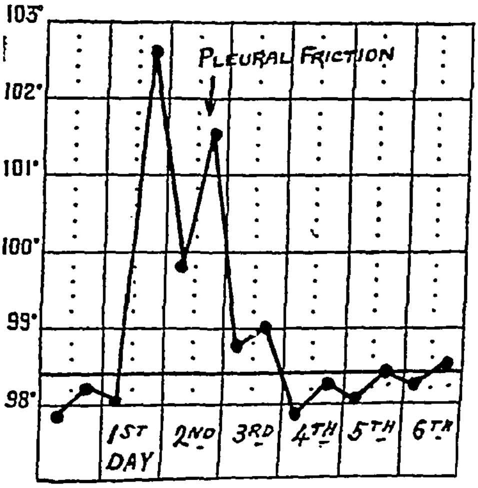
Clinical and Laboratory Notes.

EPIDEMIC PLEURISY.

By Bruce Williamson, M.B., Ch.B. Edin.,
HOUSE PHYSICIAN, PADDINGTON GREEN CHILDREN'S HOSPITAL.

The following is a brief account of a small epidemic of pyrexia, associated with dry pleurisy, which occurred during the month of June in the country branch of the Paddington Green Children's Hospital. It can only be described as an acute onset of pyrexia, lasting three or four days, associated with the development of a dry pleurisy which becomes evident usually on the second day of the fever. The ætiology is unknown. In all, 13 cases have come to my notice, of these three were among the nursing staff and the remainder children of varying ages, from 4 months to 8 years.

The incubation period appears to be short, probably under a week. It was noticeable during the outbreak that fresh cases occurred usually in groups of three, at three to five day intervals, and all have been so remarkably alike in onset, symptoms, and progress that there is little room to doubt that the illness is a definite clinical entity. The onset in all cases was abrupt and ushered in by a feeling of chilliness, a complaint of mild headache associated with a feeling of being out of sorts, and general aches all over the body, less severe than those associated with influenza. Such were the symptoms described by the adult patients, and probably also present in the younger cases. Within an hour or two the temperature began to rise and soon reached 102° F., and the pulse-rate increased to 120 or more, the younger patients being 20 to 40 beats higher. The respiratory-rate increased, and the whole picture closely resembled the onset of pneumonia. During the next 24 hours the pyrexia was maintained and might even touch 104°. Amongst the younger patients two had moderate diarrhœa. Examination on the first day revealed no signs of any inflammatory process in the lungs or elsewhere. On the second day the temperature fell slightly, but a secondary rise occurred the next day. It was on the second day, as a rule, that the patient complained of a catching pain on breathing, and the characteristic pleural friction of a dry pleurisy was heard. The area over which it was heard was generally confined to a very circumscribed single area at one base, more often in the axillary line. By the fourth day the fever had subsided and the pulse and temperature were again normal, the pleural friction and its associated pain remaining for a day or two longer and constituting the sole sign and symptom. A week after the onset the pleural rub had disappeared and none of the cases in this series has been complicated by fluid, nor has there been evidence of lung



implication at any time. In two cases a marked sudaminal rash, generalised over the body, followed the fall of temperature.

With regard to this series daily examination has not been always available, and in only seven out of the 13 cases was the presence of pleural friction established, these seven being all children. But there is little doubt as to its presence in the three adult cases, members of the nursing staff, who described the typical pain associated with the inspiratory effort, and they were aware that they had pleurisy. All the children complained of pain in the side, with the exception of the infant of 4 months, in whom it may have been present as she was extremely fretful and cried continuously for a day. The temperature chart and pulse were similar, and the duration practically identical in all cases.

RUPTURE OF THE RECTUS ABDOMINIS PRODUCED BY VOMITING.

BY JOHN WHITTINGDALE, M.B. CAMB., F.R.C.S. ENG.

SPONTANEOUS rupture of the rectus abdominis muscles may occur as the result of great and prolonged contraction during labour, or of violent convulsive spasms produced by the action of strychnine and of tetanus toxin upon the spinal cord. The case here reported presents the following features of interest: (1) Predisposing causes—advanced age and debilitated condition of the patient, (2) exciting cause—violent vomiting, (3) difficulty of diagnosis and unexpectedness of the condition found at operation.

The patient, a charwoman, aged 74 years, had been confined to her house suffering from gradually progressive myocardial failure.

History.—She had had 12 children and was able to do house-work until the age of 73. When first seen on Sept. 10th, 1923, she complained of difficulty in breathing, cough, and swelling of the legs, with cyanosis of lips, pulsating veins in the neck, irregular radial pulse, and moist sounds audible over both lungs. The abdominal wall was flaccid and the colon visibly distended and tympanitic. There was tenderness over the hepatic area of the abdomen. The urine was scanty and contained albumin. Ten minim doses of tincture of digitalis with 5 gr. of ammon. carb. were given four-hourly. Sept. 12th: Complained of diarrhœa. Digitalis replaced by 5 minim doses of tinct. strophanthi. 16th: Vomited three times, with cramp-like pains over abdomen. Strophanthus stopped and hot flannels applied. 18th, 8 P.M.: Vomited all day. Sudden violent pain in right iliac region with a sensation as if something had given way. Complete constipation with retention of urine. Abdomen distended and tympanitic and muscles over right iliac region tender and rigid.

The patient was now very collapsed and apparently moribund. A diagnosis of mesenteric embolism was suggested and operation was not advised, as the patient did not seem likely to survive the journey to hospital. A hypodermic injection of morphine and atropine was given. Sept. 19th: Patient much better, retained water, tea, and jelly; complained of lump in right side of abdomen. On examination, a large swelling was found occupying the right half of the abdomen, extending from the symphysis pubis to the right hypochondrium; the overlying skin showed ecchymosis. The mass was pyriform in shape with well-defined borders; of solid consistence and tender to touch. Patient was removed by car to the Yeatman Hospital, Sherborne, a journey of eight miles.

Operation (20th).—Under chloroform a right paramedian incision was made extending from the symphysis pubis to the umbilicus. The superficial fascia was œdematous. On opening the anterior layer of the sheath of the rectus blood-clot escaped and a large ragged cavity was found in the substance of the muscle from which 6 oz. of blood and clot were evacuated. This was treated with spirit and bipp. It was then obliterated as far as possible with interrupted catgut sutures. The anterior layer of the sheath and the skin incision were closed without drainage. The wound healed per primam and the patient returned home on Oct. 8th.

On discharge, the patient was comfortable and showed no sign of myocardial embarrassment as long as she remained in her chair. The œdema of the feet and legs had disappeared and the breath sounds were clear.

It is worthy of note that in spite of the advanced age of the patient and the considerable degree of shock to which she was subjected, the ultimate result was an amelioration of her general condition.

THE GROWTH OF MAMMALIAN TISSUES IN PURE SERUM.

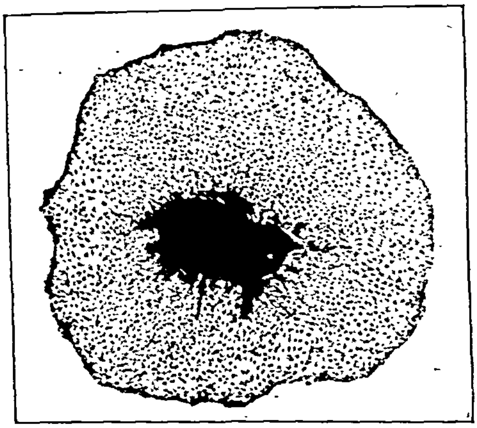
BY THOMAS LUMSDEN, M.D. ABERD.

(*From the Department of Experimental Pathology, Lister Institute.*)

Carrel and Ebeling[1] have succeeded in growing chicken fibroblasts in vitro for over 12 years, but no medium has yet been discovered in which mammalian tissues or a pure strain of glandular epithelium can be grown indefinitely. Mammalian tissues do, however, grow vigorously for some weeks in vitro, but the media employed have been very complex and the methods troublesome. Dr. A. H. Drew, who kindly showed me his technique, uses a mixture of (1) modified Locke's fluid, (2) embryo extract, (3) serum, and (4) autolysed tissue extract. He tells me that the shortest time in which anyone has yet become proficient in this technique is four months.

The purpose of this note is to indicate that equally if not more vigorous growth (Fig. 1) may be obtained in pure serum alone, providing that certain essential precautions are taken. The first of these is that the serum must be absolutely sterile, and the second, scarcely less important, is that its pH must not exceed 7·7.

FIG. 1.



Young rat kidney (× 30). Three days' growth in pure rat serum.

It is, I suppose, common knowledge that if serum is freely exposed to the air it rapidly gives off CO_2, so that if when first exposed its pH was 7·5, in five or ten minutes the pH will be 8 or over. This being so, it is essential either to prevent this loss of CO_2 or to replace it by exposing the serum to an atmosphere of 5 per cent. CO_2 in air for 10 to 15 minutes. There are some other variable factors in the serum and in the tissue which I am attempting to ascertain, but if the serum is sterile and of optimal reaction (pH 7·5 or so) then from 80 to 100 per cent. of successes may be anticipated. The use of pure serum obviates the need for embryo and autolysed tissue extracts, and for the use of filters, ice, &c. The simplification in the technique is so great that anyone trained to asepsis can obtain vigorous growth after a week's practice.

Technique.—The blood is drawn from the heart of a half-grown animal as quickly as possible, and is at once poured into a centrifuge tube, which is tightly corked. After separation of the clot and centrifuging, the serum is transferred rapidly, and with rigid aseptic precautions, to a series of capillary tubules made of resistant glass; these are immediately sealed up. The pH of the serum now remains practically constant and should be 7·5 or 7·6. It can be used as a culture-medium for several weeks at least. Heterologous serum appears to act almost as well as homologous. (Fig. 3.) The tissue used was almost invariably the kidney of a rat three to four days old, but heart, spleen, testis, cartilage, &c., also grow in serum alone. There is no magical dividing line between born and unborn animals in regard to growth, but the younger *the tissue the earlier it begins to grow. Both* embryo and autolysed tissue extracts have a buffering effect on serum; up to now I have seen no evidence that they have (on mammalian tissues) any other action. I have not found that re-feeding growing cells with autolysed tissue extract had any harmful effect. (Fig. 2.) All growing tissues require to be re-fed with fresh serum daily or at least every second day.

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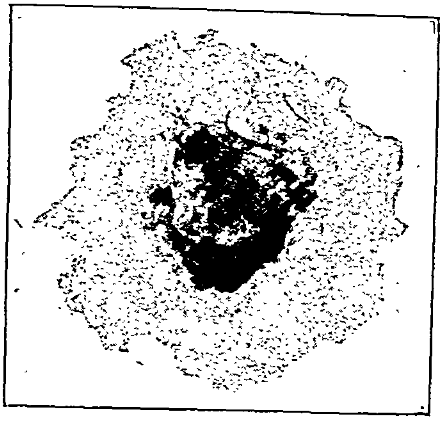
[1] Jour. Exp. Med., 1913, 1919, 1922.

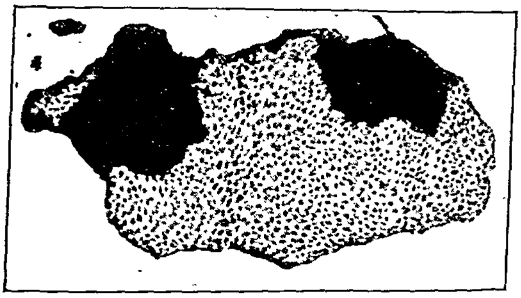
Fig. 2.



Embryo rat kidney (× 15). Six days' growth in serum and autolysed tissue extract (equal parts).

Growth takes place either in the form of a carpet of cells adhering to the cover-glass or in spheroidal form if adhesion has not occurred; often these two varieties of growth coexist. The newly forming cells appear to feed on the serum constituents, for I have been able to remove the old fragment completely; the carpet of new cells left behind generally shrivels, but from the shrivelled mass a new carpet of freshly-growing cells may develop.

Fig. 3.



Young rat kidney (× 37½). Grown in rabbit serum for five days, showing junction of two carpets originally separate.

Cells only grow actively if anchored in some way —e.g., to the cover-glass, to a foreign body (cotton fibre or such like), or the original fragment may be the point d'appui.

If injured mechanically or if fed with an unsatisfactory medium, the growth may become partially detached from the coverslip and shrivel rapidly, assuming a lace-like or sometimes a tubular appearance. Even if the medium is apparently satisfactory, new cells tend to shrink and become fatty after four or five days; the first carpet may disintegrate, but a new one soon replaces it, and so growth continues for three or four weeks with a "wave-length" of a few days.

Medical Societies.

EDINBURGH OBSTETRICAL SOCIETY.

At a meeting of this Society held on June 4th, Prof. B. P. Watson, the President, being in the chair, Dr. Francis J. Browne read a communication on

Further Observations on the Prevention of Antenatal, Intranatal, and Neonatal Death.

Dr. Browne explained that his paper was based on 200 consecutive cases of stillbirth occurring in fœtuses of viable age. The method of investigation was the same in each case—a complete post-mortem examination of the fœtus or infant and placenta was made, including a microscopical investigation of the organs, and the case-history was obtained. The mother was then examined and questioned regarding her family and personal history, and when possible the father was also questioned. From the information thus obtained an attempt was made to arrive at a decision as to the cause of death and to draw conclusions of practical importance regarding the management of pregnancy and labour. In a previous paper read to the Society, Dr. Browne had classified the causes of death under ten headings, such as craniotomy, asphyxia, or syphilis, &c., but in this series of cases he had adopted a new classification which possessed certain advantages over his former one. He divided the causes of death into three sections: antenatal, intranatal, and neonatal, and these were further subdivided into several groups.

Antenatal Death.

The causes of antenatal death had been classified as follows: 1. Toxæmic: (*a*) syphilis, (*b*) placental infarction, (*c*) utero-placental apoplexy, (*d*) premature senility of the placenta, (*e*) maternal glycosuria, (*f*) eclamptic convulsions, (*g*) drugs. 2. Mechanical: (*a*) placental separation in placenta prævia, (*b*) placental separation from trauma, (*c*) knots or torsion of the cord. 3. Developmental: (*a*) one artery in the cord (?), (*b*) small placental area, (*c*) general œdema of the fœtus, (*d*) other congenital abnormalities. 4. Undetermined: Syphilis was found to be the most frequent cause of antenatal death occurring in 24 cases, but in only 15 of these was the spirochæte demonstrated. In attempting to diagnose the cause of death in the macerated fœtus little in the external appearances was of help except that the abdomen might be prominent in the syphilitic fœtus on account of the large liver. Internally, the liver in the syphilitic fœtus was found to be of firm consistence owing to the presence of a dense framework when cirrhosis was present, and often of a greyish-brown colour, and the organ enlarged. In the non-syphilitic liver there was little fibrous tissue; the organ was extremely cellular, its glycogen content was large, and maceration resulted in a rapid diminution of its size. A normal fresh liver might weigh as much as one-twelfth of the body-weight; anything over this was probably syphilitic, and the spleen of a normal fresh fœtus might weigh one one-fiftieth of the body-weight. Any weight ratio over 150 was probably an evidence of syphilis. Dr. Browne had found that in the case of a fresh fœtus at the eighth month or over the weight ratio of the placenta might vary normally between 4 and 16, but that a ratio above 4 was abnormal provided there was no abnormal intra-placental clotting (red or white infarcts). Below the eighth month this rule did not hold and a ratio of two or even one or less might be looked upon as normal. Dr. Browne had never seen red infarcts in a syphilitic placenta, and this was of interest because whatever the explanation of infarct formation, the syphilitic placenta above all others was the one in which obliterating endarteritis of the fœtal vessels was found. In albuminuria of pregnancy or chronic nephritis, red and white infarcts were extremely common. In the speaker's experience the presence of a strongly positive Wassermann reaction was very decisive evidence of the presence of syphilis in a pregnant woman. There was no doubt also that a woman might have a persistently negative Wassermann reaction and yet produce a succession of syphilitic fœtuses, but Dr. Browne had never met with a case in which a mother with a negative Wassermann produced a spirochæte positive fœtus. This, of course, raised the question as to how far it is justifiable to diagnose syphilis of the fœtus from the so-called secondary signs—viz., enlarged liver, spleen, and placenta. In doubtful cases there was also always the therapeutic test, and full courses of N.A.B. might be given to the mother. Maternal glycosuria was a rare cause of fœtal death. At present the prevention of antenatal death was practically limited to cases of albuminuria and syphilis, and in Dr. Browne's opinion about 60 per cent. of his cases might have been prevented by adequate antenatal supervision.

Intranatal Death.

Dr. Browne classified the causes as follows: Traumatic: (*a*) craniotomy, (*b*) cerebral hæmorrhage, (*c*) asphyxia, (*d*) suprarenal hæmorrhage, (*e*) other injuries. 2. Infective: pneumonia. 3. Toxæmic: scopolo-morphine narcosis. 4. Developmental. 5. Undetermined. Amongst these cases asphyxia accounted for more than half the total. Craniotomy was performed in 14 cases of the 200. In five of the 14 cases there was catarrhal pneumonia present.

Considering cerebral hæmorrhage, Dr. Browne pointed out that it was entirely a matter of the site and degree of hæmorrhage whether death took place during or shortly after birth. Referring to the hæmorrhagic diathesis, attention to which had been drawn by Warwick, the speaker said that, though he had seen no case in which it was necessary to assume the presence of this diathesis in his first series of cases, since then he had come across two cases which might be placed in this category. Breech delivery was ten times more likely to give rise to cerebral hæmorrhage as is delivery by the vertex. Dr. Browne then described in detail the ætiology of cerebral hæmorrhage in his cases. It was probable that undue haste in delivery of the after-coming head was responsible for many of the injuries. The unborn child could apparently bear the cutting off of its oxygen-supply for a much longer period than an adult and might be left undelivered after birth of the breech for as long as 20 minutes without injury. Potter, out of his great experience of breech deliveries, had said that instead of using forceful haste we must be deliberate and deliver gently and gradually the after-coming head. The points to be observed in the prevention of cerebral hæmorrhage were: (*a*) avoidance of breech deliveries by the performance of external cephalic version about the commencement of the ninth month; (*b*) the avoidance as far as possible of difficult forceps deliveries, and also hasty delivery; and (c) the limitation of induction of labour to cases which have completed the thirty-fifth week. A study of 36 cases of intrapartum asphyxia revealed the fact that about 75 per cent. might reasonably be classed as preventable. There was no doubt that many cases of asphyxia which occurred during prolonged labour, natural or otherwise, could be prevented by the induction of labour about ten days before term.

The value of the hydrostatic test for live birth was then discussed, and certain fallacies, such as artificial respiration, pointed out. But apart from these it was evident the lungs were not infrequently more or less inflated in infants that had unquestionably been born dead, and in whom no method of artificial respiration had been carried out. Dr. Browne expressed his entire agreement with the statement in Taylor's "Medical Jurisprudence" that "for respiration however complete or incomplete to be considered proof of live birth, an eye-witness to these respirations is essential." In his two series of cases there were 27 cases in which suprarenal hæmorrhage was the cause of death and in this connexion, he said, three facts stood out—viz., its frequent association with asphyxia, its greater liability to occur in the right gland, and its greater frequency during breech delivery. Suprarenal hæmorrhage was probably caused by the backward pressure of blood in the inferior vena cava found in asphyxia and by the compression of the latter between the liver and vertebral column in breech delivery.

Neonatal Death.

Of this there were in his present series 73 cases, and the many causes were classified under traumatic, infective, prematurity, toxæmic, developmental, and other conditions not peculiar to the new-born—e.g., gastro-enteritis. By far the commonest cause was an antenatal infection—e.g., syphilis. Pneumonia was found in 24 out of the 73 cases. It was probable that the infection might occur and the disease commence before birth. Even in those cases in which the disease was found to be advanced at autopsy, the true condition had not been suspected during life and no characteristic symptom noted which might have led to a physical examination. When a young infant was cyanosed, with cold skin and extremities, fed badly, and was fretful, pneumonia should be suspected. Dr. Browne went on to describe some cases of intranatal pneumonia and discussed the path of infection, and he suggested that when a fœtus was being asphxiated its respiratory centre was stimulated by the accumulating CO_2 in its blood and thereby the fœtus inspired, drawing infective mucus or liquor into the trachea or bronchi. The author then briefly referred to toxæmic causes and prematurity. Regarding the prevention of stillbirth, Dr. Browne said that it was surely unnecessary to emphasise the need for adequate antenatal supervision during pregnancy, but there were one or two points to which he would like to draw particular attention. He thought that a strong case could be made out for the routine induction of labour in primigravidæ about ten days before term. This guarded against the production of asphyxia and an easier and less prolonged labour was thereby ensured. Secondly, he would emphasise the danger of breech deliveries and urge the necessity for prophylactic external version at the beginning of the ninth month. Much could be done to shorten labour by external rotation of posterior cases by means of pads, and special wards set apart for infants would do much to guard them from such infections as pneumonia.

Prof. B. P. WATSON said that he admired the way in which Dr. Browne had tackled this subject.

Dr. WILLIAM FORDYCE doubted the wisdom of inducing labour ten days before full time, and Dr. HAIG FERGUSON also joined in the discussion.

Dr. BROWNE briefly replied.

Exhibition of Cases and Specimens.

Dr. HAIG FERGUSON described in detail a strange case of a pendulous tumour of the labium majus exhibiting unusual features. The case had been taken for a hernia into the labium, but laparotomy proved that it had no connexion with the peritoneal cavity, and he had dissected out the growth. Dr. Ferguson could find no record of an exactly similar case in the literature, and a pathologist had expressed the opinion that the growth was a telangiectatic fibromyoma with hyaline degeneration.

A number of specimens were then shown. Dr. FORDYCE described an unusual fibroid tumour.—Dr. FERGUSON showed a uterus with squamoid metaplasia of the gland epithelium with early malignancy, and in the same patient an ovary showing early sarcoma.—The PRESIDENT described three specimens: (*a*) an ovary with chocolate cysts; (*b*) large ovarian tumour removed from a patient six months pregnant; (c) uterus removed by vaginal hysterectomy from a case of complete prolapse showing great elongation of the supravaginal cervix.

Reviews and Notices of Books.

Human Protozoology.

By Robert W. Hegner, Ph.D., and William H. Taliaferro, Ph.D. New York: The Macmillan Company. 1924. Pp. 597. 21s.

As an introduction to the subject of medical protozoology this book satisfies a need. The information, which has been gathered from authoritative sources and the authors' own experiences, is presented in a clear and intelligible form. There are two coloured plates of malarial parasites and numerous illustrations in black and white, many of them original. The book assumes no previous knowledge of the subject, and will prove of great assistance to those who approach this branch of medical science for the first time. It represents essentially the subject-matter of the course in protozoology given by the writers in the School of Hygiene and Public Health of the Johns Hopkins University, and will be of considerable assistance to those who are taking out courses in tropical medicine at one or other of the recognised schools.

After a few introductory remarks on the organisation and method of reproduction of protozoa in general, the four classes—Sarcodina, Mastigophora, Sporozoa, and Infusoria—are considered in detail. In the description of each class a section devoted to general considerations, including the morphological characteristics, classification, and physiology of the class, with reference to free-living as well as parasitic forms, is followed by a detailed account of the parasites of man, with some reference to the allied species which occur in animals. The book concludes with two chapters in which the genetics and physiology of reproduction and the diagnosis of the intestinal protozoa are discussed. In the section dealing with the amœbæ parasitic in man the well-known species are carefully described; the generic title *Entamœba* is spelt *Endamœba*, a procedure which though usual in America is not generally adopted in other countries.

In considering the cultivation of the *Entamœba histolytica* Cutler's work is mentioned, and reference is made to Barret and Smith's successful cultivation of an *entamœba* of the turtle. The parasitic Mastigophora are dealt with in two chapters entitled Hæmoflagellates and Intestinal Flagellates. In the former are considered the trypanosomes and leishmania which infect man, as well as some of the forms which occur in animals. It would have been advantageous if room could have been found for a more detailed and illustrated description of *Trypanosoma vivax*, *Trypanosoma congolense*, and *Trypanosoma evansi*, especially as considerable space has been devoted to *Trypanosoma lewisi* of the rat. The intestinal flagellates of man are carefully described. It is assumed that the flagellate described as *Tricercomonas intestinalis* by Wenyon and O'Connor is the same as one previously named *Enteromonas hominis* by Fonseca; this is by no means clear, however, as the descriptions of the two organisms vary considerably. The Sporozoa receive due attention; the hæmogregarines are grouped in a single genus *Hæmogregarina* under the Hæmosporidia, a procedure not in accord with recent investigations. In the chapter devoted to the genetics and physiology of reproduction the various phenomena, such as binary fission, conjugation and its physiological effects on the race, endomixis, and asexual and sexual reproduction in its relation to inheritance and race production are explained with special reference to parasitic forms. The chapter on the diagnosis of intestinal protozoa presents valuable information. The method of making preparations of fæces for diagnostic purposes, concentration methods for encysted forms, the vegetable organisms which may cause confusion, and the large group of coprozoic organisms which often lead students astray, all receive consideration. Finally there is included a comprehensive bibliography as well as a good index of authors and subjects.

This useful volume can be thoroughly recommended.

Ear, Nose, and Throat.

Diseases of the Nose, Throat, and Ear. For Practitioners and Students. Edited by A. Logan Turner, M.D., F.R.C.S.Edin., Surgeon-Consultant, Ear and Throat Department, Royal Infirmary, Edinburgh. Bristol: John Wright and Sons. 1924. Pp. 413. 20s.

In 1912 Dr. W. G. Porter published a very useful manual of moderate size on diseases of the throat, nose, and ear for practitioners and students; this proved highly successful, and a second edition was brought out in 1916 edited by Dr. P. McBride for the author, who was at that time absent on war service. Dr. Porter was killed in action in France in 1917, and a third edition was published in 1919, under the editorship of Dr. A. Logan Turner, by his former colleagues in Edinburgh, as a tribute to his memory. This has now been expanded under the same editorship into the present volume. It is planned on lines similar to those of Dr. Porter's original book, and has been expanded by about 50 per cent.; being written for practitioners and students, full details of the larger operations are not given, but only sufficient to provide a clear idea of their method and scope; while the indications for such operations are fully discussed, the details of after-treatment, which often falls to the practitioner, might in places be more fully described. Dr. A. Logan Turner and Mr. W. T. Gardiner are responsible for the section on diseases of the nose, Dr. Logan Turner for that on the paranasal sinuses; Mr. Douglas Guthrie has undertaken the pharynx and nasopharynx, Mr. J. D. Lithgow the larynx, Mr. G. Ewart Martin peroral endoscopy, and Mr. J. S. Fraser the ear. The illustrations are many and good; the book is well balanced and clearly written, and may confidently be recommended for the use of students and practitioners.

Chirurgie de l'Oreille, du Nez, du Pharynx, et du Larynx. Second edition. By Georges Laurens. Paris: Masson et Cie. 1924. Pp. 1052. Fr. 100.

We congratulate Dr. Georges Laurens on the production of this standard work on the subject. The steps of operations are well described, alternative methods being given; the indications and contra-indications for particular operations are discussed, and after-treatment and results of operation are considered. The illustrations are numerous and show clearly the stage of operation under consideration. Besides the more common operations, those less often practised receive full consideration; thus removal of tumours of the cerebello-pontine angle is described, together with a brief account of their symptoms; and such subjects as stenosis of the larynx and trachea, and difficulty of decannulisation after tracheotomy, receive adequate attention, while endoscopy is well described and illustrated. In most subjects the practice is very similar to that of this country, the most marked difference being the much greater use of local and far less frequent employment of general anæsthesia; each operation is preceded by a complete and illustrated description of the technique of local anæsthetisation, which will be most useful to surgeons here who are less familiar with the method. Of laryngectomy the author says, "Two points are to be remembered: the superiority of local and the dangers of general anæsthesia"; although the technique of the former is difficult and elaborate, we might perhaps employ it with advantage more frequently in this country for major operations on the larynx and trachea, as we now do for such smaller operations as tracheotomy. But we disagree entirely with the recommendation for removal of tonsils in children, to operate without anæsthesia, or to give ethyl chloride with the child in the sitting posture; the nervous shock caused by these operations without anæsthesia far more than offsets the slight danger of a skilfully given general anæsthetic, and ether is preferable to ethyl chloride as it gives time for a deliberate operation and the control of hæmorrhage. Indeed, we cannot but consider that, in the whole matter of tonsil operations the practice in France, as shown in this and other recent publications, is behind that of Great Britain and America. Dr. Laurens prefers tonsillotomy, and the method of *morcellement*, to complete removal, although he admits that, "on assisting at a well-performed tonsillectomy, one is sometimes surprised to see a buried tonsil, quite small in appearance, show at the end of the forceps as a fungating tumour of a size which one would never have suspected and infiltrated with infected caseating foci." Of the guillotine he states that "it is no longer employed, and is an instrument relegated to the museum-case, though perhaps it does not deserve this, for it cuts the pedunculated tonsils of small children quite well"; of the blunt "reversed guillotine" methods associated with the names of Whillis and Sluder, which are extensively and successfully employed here to remove the tonsil completely in its capsule, he only says that "Sluder has modified the old tonsillotomy, but his method is not applicable to all cases."

Dr. Laurens's book covers the entire field of surgery of the ear, nose, and throat, and is well worth study.

Ear, Nose, and Throat Treatment in General Practice.
By GEORGES PORTMANN, M.D., Professor Agrégé of Oto-Rhino-Laryngology, Faculty of Medicine of Bordeaux. Translated and edited by R. SCOTT STEVENSON, M.D., Assistant Surgeon, Metropolitan Ear and Throat Hospital. London: William Heinemann. 1924. Pp. 180. 10s. 6*d*.

THIS little book deals almost entirely with the drug treatment of diseases of the ear, nose, and throat, and has been made more available to practitioners in this country by the translation of the prescriptions into English weights and measures. The translator has made certain modifications where the accepted British and French opinions on a subject are quite incompatible, and it would, perhaps, have been well to indicate in the text where this has been done; he also draws attention to Dr. Portmann's free use of cocaine, especially in acute conditions, as contrary to British practice. The book is arranged as a list of diseases, each disease being headed by a title and a short description followed by an account of the local treatment advised, and, finally by general treatment. The latter is in general very condensed; little or no indication is given of the rarity of the affection under discussion, nor of its severity, and we are seldom told whether the patient should be kept in bed or allowed to continue his work. It is sometimes difficult to recognise the variety of disease concerned by the title and description in the heading. Under local treatment a large number of prescriptions are given for gargles, "throat baths," paints, and sprays, many of these being frequently repeated with slight variations under different headings; this section is the most valuable feature of the book, and should be useful both to the consultant and general practitioner.

UROLOGY.

Archives Urologiques de la Clinique de Necker.
Published by F. LEGUEU, Professeur de Clinique des Maladies des Voies Urinaires, Chirurgien de l'Hôpital Necker. Vol. IV., Part 1. Paris: A. Maloine et Fils. 1923. Pp. 97.

THIS is a collection of papers by various authors who have worked in Prof. Legueu's clinic. Vaccine treatment of abscess of the prostate is dealt with by P. Fouquiau, who concludes that the disease is rendered less serious and its course shortened by the exhibition of a staphylococcal vaccine. Prof. J. G. Cano describes a new intravenous treatment of gonorrhœa by means of a mixture of methylene-blue and phenol dissolved in an animal serum rich in albumin and globulins. The results show a more rapid cure and a freedom from complications, especially from chronic gleet. Anghel calls attention to ulcerative lesions which are provoked by an indwelling catheter at the penoscrotal angle and gives advice as to how such lesions may be prevented. H. Béclère and B. Fey give an interesting discussion on the differential diagnosis by radiography between stone in the kidney and biliary calculus. Other contributions are: Infection of the Adenomatous Prostate (Astraldi), Peri-Urethral Abscess (Manthopoulo), and Traumatic Rupture of a Varicocele (Astraldi).

SURGICAL HANDICRAFT.

A Manual of Surgical Handicraft and Physiotherapy.
Vol. I. By J. RENFREW WHITE, M.S., F.R.C.S., Assistant Surgeon, Dunedin Hospital; Assistant Lecturer in Clinical Surgery, University of Otago. Dunedin: Coulls, Somerville, Wilkie, Ltd. 1923. Pp. 566–xxi.

THE author states in his preface that he has written his book for junior medical students, but certainly it should be read by residents and practitioners. It resembles in its general arrangement and in subject-matter the usual house surgeons' manual of surgical handicraft, but has special features of its own which render it particularly useful. For example, full instructions are given in the mechanism and use of the autoclave, the administration of enemata, the application of radiant heat, the transport of patients, and the conduct of operations. Special formulæ, which are sometimes difficult to find, are easily discovered by reference to the index and a commendable feature is the author's practice of describing the use of special methods—Beck's paste method, for instance—in the originators' own words. It is probable that in the next edition the author will be able to eliminate a certain number of methods and formulæ which are now falling into disuse.

ORGANIC SUBSTANCES, SERA AND VACCINES IN PHYSIOLOGICAL THERAPEUTICS.

By D. W. CARMALT-JONES, M.D. Oxon., F.R.C.P. Lond., Professor of Systematic Medicine, University of Otago, New Zealand. London: William Heinemann. 1924. Pp. 395. 15*s*.

IN selecting his title Prof. Carmalt-Jones appears to have ignored the fact that drugs of vegetable origin are as much "organic substances" as those derived from the animal kingdom. It is to the latter alone, and in particular to those manufactured from organs known or alleged to have a content of "hormone," to which the first section of the book is devoted. The most vivid resemblance at present discernible between these particular "organic substances" and the equally organic sera and vaccines dealt with in the remaining sections lies in the vast amount of theorising to which they all have given rise, and the frequently doubtful results of their exhibition. A further point in common to "organo-" and vaccine-therapy is that both in the minds of many practitioners are invested with a certain measure of mystery. It is for the practising medical man that Prof. Carmalt-Jones has written, and this last consideration may have weighed with him in bringing his expositions of the two varieties of therapeusis together in one volume.

To the practising physician the author's clear and detailed indications for the exhibition and dosage of the substances with which he deals should prove of very real value, though descriptions of the technique of such procedures as the complement-fixation test and the determination of the opsonic index may be of little interest to the bulk of practitioners, while as given by Prof. Carmalt-Jones they are not detailed enough for the guidance of the laboratory worker. Failure to provide the minutiæ of details of technique cannot, however, be imputed to the author as a general fault; pp. 132 to 138 are devoted entirely to a description of the method of taking blood from a vein for culture, at the conclusion of which the reader is left with a syringe full of blood and no instructions as to what to do with it before it clots. The section on serum-therapy would have been rendered more valuable by a consideration at greater length of anaphylaxis, and by the inclusion of details of the methods for testing for sensitiveness and of abolishing it when discovered. In this connexion it is noteworthy that although the terms "apo-" and "epi-phylaxis" with which Sir Almroth Wright has enriched the language both find places in the index, the more generally recognised "anaphylaxis" fails to do so.

We mention these points that they may be rectified in subsequent issues.

BRITISH GUIANA MEDICAL ANNUAL, 1923.

Edited by F. G. ROSE, M.B., B.C. Cantab. Demerara: Daily Chronicle, Ltd., Georgetown. Pp. 181. 7s.

THIS is a selection of papers presented at the West Indian Medical Conference—most of which reach a high standard of accomplishment. But it is stated that in all probability this issue will be the last, as it is hoped to establish a combined West Indian medical journal. The editor contributes a useful study of the biological characters of the effluents from septic tanks in British Guiana, as well as a paper on the leucocytes in filariasis and the use of vaccines in that disease. There are two papers on alastrim, by Dr. J. R. Dickson and Dr. C. S. Gideon, the general opinion seeming to favour its differentiation from true small-pox, a view not usually held. Dr. Wolff, Government bacteriologist of Dutch Guiana, writes on dermal leishmaniasis in Surinam; Dr. J. Anderson on dysentery, its diagnosis and treatment; and Dr. C. U. Lee submits a report upon the incidence of filarial infection amongst the Chinese and immigrant races in Georgetown. Dr. W. de W. Wishart contributes two papers on public health problems in Georgetown, one dealing with infant welfare. The Editor and Dr. J. E. Chow have written a résumé of scientific work published by medical men in British Guiana from 1769 up to the present day. Various of the short clinical papers now incorporated in this Annual were printed in the Transactions of the British Guiana branch of the B.M.A.

CANCER.

How it is Caused. How it Can be Prevented. By J. ELLIS BARKER. With an introduction by Sir W. ARBUTHNOT LANE, Bart. London: John Murray. 1924. Pp. 432. 7s. 6d.

THE message of Mr. Ellis Barker is that civilised mankind suffers from constipation, chronic poisoning by the chemicals used as food preservatives, and vitamin starvation, and that this is responsible for much ill-health. This is not new, though the author does his best to make it look new by employing in his writings the polemical methods which are effective in dealing with political and economic matters—subjects which have occupied his attention in the past. He then proceeds to argue that cancer being, as he says, a disease of civilisation, is due to dietetic errors inducing chronic poisoning and vitamin starvation. In supporting his view he produces statistical fallacies which have done duty often for this kind of argument. Mr. Ellis Barker is very ill-informed on the subject on which he writes—apparently as a self-constituted authority. If we accepted his statistical fallacies we could use his arguments to prove that cancer is due to an excess of vitamins. For has not in Japan the incidence of cancer increased greatly, while at the same time that of beri-beri has diminished?

New Inventions.

A SYRINGE FOR REGIONAL ANÆSTHESIA INCLUDING SPLANCHNIC ANALGESIA.

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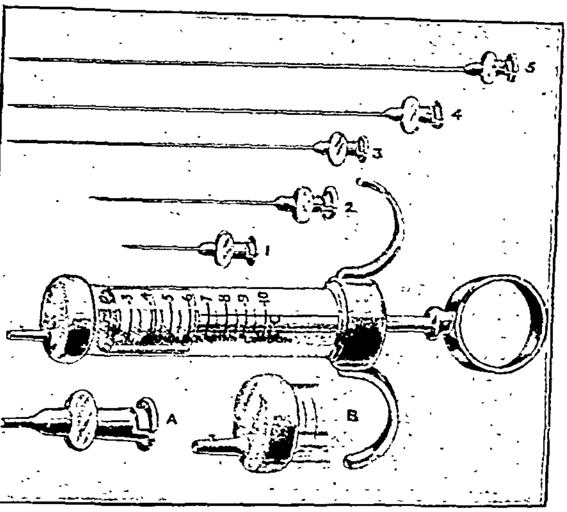

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O. STANLEY HILLMAN, F.R.C.S. Eng.

Middlesex Hospital, London, W.

THE LANCET.

LONDON: SATURDAY, JULY 12, 1924.

THE NATIONAL PHYSICAL LABORATORY.

AT the invitation of the President of the Royal Society, a large company gathered at the National Physical Laboratory on June 24th to visit the research and testing departments. The inspection, an annual event, is greatly appreciated by scientists, for it affords an opportunity of gaining first-hand information about current physical problems from experts who are bent on solving them. The efficiency in routine measurement and activity in research observable in all departments of this laboratory is a valuable lesson in scientific method and industry. In the thermometry section, for example, approximately 15,000 clinical thermometers are tested weekly. Soda-glass instruments show a tendency to fail as maximum thermometers, and this deficiency has made it desirable to detect these instruments quickly. For this purpose an X ray set has been installed. When a trayful of thermometers is passed between the X ray bulb and a fluorescent screen, the greater transparency to X rays of soda-glass instruments renders them easily distinguishable from those made of glass approved by the laboratory.

One of the new features in the radiology department is the testing of materials used in radiotherapy. For measurements of the lead equivalents of protective materials either a balance or a substitution ionisation method is used, the former for protectives equivalent to 0·1 mm. lead and the latter for thicker materials. Stress is laid upon the importance of testing lead-free protective materials at more than one exciting voltage on the X ray tube. Radiographs of commercial ebonite often indicate metallic dust distributed through the material, which renders it valueless for insulating purposes. Facilities have, therefore, been provided for the radiographic examination of materials used in the construction of apparatus. The importance of a preliminary radiographic examination of insulating materials, which would prevent the frequent occurrence of insulation trouble in high tension apparatus, can hardly be over-estimated. We note with satisfaction that the department is now prepared to test all kinds of X ray and electro-medical apparatus. Performance tests on high tension transformers, coils, couches, screening and tube stands are becoming a routine practice, and endurance and efficiency tests are also undertaken. The efficiency of apparatus in current use would appear of secondary importance; for this is seldom known, so that it is common to find apparatus being run far below its maximum efficiency with consequent waste of time and energy. The radiology department will doubtless make a feature of efficiency tests, the results of which may well lead to material improvement in the design and standardisation of X ray and electro-medical apparatus. The fees for the above tests are high, but as the supply of instruments for testing increases, they will be reduced. Considerable experimental work on the methods of obtaining high vacuums has been done at the laboratory, resulting in important technical improvements in existing methods. Annular mercury jet pumps have been constructed in metal which have decided advantages over the usual glass diffusion pumps; these are considerably more efficient, being capable of exhausting at the rate of 7 litres per second, so that a high degree of vacuum can be obtained in a well-prepared X ray tube in a few seconds.

During the past year the department of sound has been extended considerably, and a variety of problems are now receiving experimental treatment. The acoustic features of rooms are being studied by a ripple tank method. A wooden model, based on section drawings of a hall, is laid flat upon the bottom of the tank. The propagation of waves through a room, caused by a mechanical dipper which disturbs the water within the model, may be observed directly or photographed. By this means it is possible to determine what structural alterations to the hall are necessary to remove its acoustic defects. Researches on the photography of sound are also proceeding and some interesting results have been obtained. By the ingenious method of placing two point sparks gaps of different metals in series, the light from one renders visible for a short time the sound disturbance from the other. Experiments on the transmission and reflection of sound by partitions are being conducted in padded rooms. The method adopted is to reflect sound from a loud speaker to the partition under test by means of a parabolic reflector. The properties of the sound issuing in various directions from the partition are then tested by electrical means. Another interesting example of research in applied science is the investigation of the problems of refrigeration which has been begun at the laboratory during the past year. Models of ships holds are made and the temperature distribution in them is measured by a system of thermo-couples. Smoke is used to watch the circulation of air in the hold, which should be efficient to remove the large quantities of carbon dioxide evolved from fruit and to establish a uniform temperature. The question of a packing material suitable for perishable goods is also under consideration, and experimental data are being collected to determine the most suitable substances for this purpose. In this problem the thermal conductivity of the material is an important factor and has been determined for a variety of substances such as expanded rubber and compressed cork.

The advance in research and technique which has been made at the laboratory during the past year has been remarkable, and forms a valuable contribution to our national scientific equipment.

TOWN PLANNING LEGISLATION.

THE two Town Planning Bills (for England and Scotland respectively) have now emerged from Joint Select Committee in amended form, and it may be hoped that they will have an opportunity of becoming law this session. Each of the Bills consolidates the existing legislation (beginning with the Act of 1909) into a convenient document containing 22 sections and four schedules. It would not have been difficult to make one Bill serve for both England and Scotland, a clause being added to comprise such adaptations as are necessary in view of the different central and local authorities in Scotland and in view of the unassimilated details of Scottish administration. Scottish feeling, however, is naturally in favour of having a separate Bill for Scotland, and Scottish influence in Parliament, never negligible, is strong to-day. If these two measures can be passed, we hope that the excellent consolidating Bill which the Ministry of Health has prepared for dealing comprehensively with the law of National Health Insurance will also be given a of technique cannot, however, be imputed to the author as a general fault; pp. 132 to 138 are devoted entirely to a description of the method of taking blood from a vein for culture, at the conclusion of which the reader is left with a syringe full of blood and no instructions as to what to do with it before it clots. The section on serum-therapy would have been rendered more valuable by a consideration at greater length of anaphylaxis, and by the inclusion of details of the methods for testing for sensitiveness and of abolishing it when discovered. In this connexion it is noteworthy that although the terms "apo-" and "epi-phylaxis" with which Sir Almroth Wright has enriched the language both find places in the index, the more generally recognised "anaphylaxis" fails to do so.

We mention these points that they may be rectified in subsequent issues.

British Guiana Medical Annual, 1923.

Edited by F. G. Rose, M.B., B.C. Cantab. Demerara: Daily Chronicle, Ltd., Georgetown. Pp. 181. 7*s*.

This is a selection of papers presented at the West Indian Medical Conference—most of which reach a high standard of accomplishment. But it is stated that in all probability this issue will be the last, as it is hoped to establish a combined West Indian medical journal. The editor contributes a useful study of the biological characters of the effluents from septic tanks in British Guiana, as well as a paper on the leucocytes in filariasis and the use of vaccines in that disease. There are two papers on alastrim, by Dr. J. R. Dickson and Dr. C. S. Gideon, the general opinion seeming to favour its differentiation from true small-pox, a view not usually held. Dr. Wolff, Government bacteriologist of Dutch Guiana, writes on dermal leishmaniasis in Surinam; Dr. J. Anderson on dysentery, its diagnosis and treatment; and Dr. C. U. Lee submits a report upon the incidence of filarial infection amongst the Chinese and immigrant races in Georgetown. Dr. W. de W. Wishart contributes two papers on public health problems in Georgetown, one dealing with infant welfare. The Editor and Dr. J. E. Chow have written a résumé of scientific work published by medical men in British Guiana from 1769 up to the present day. Various of the short clinical papers now incorporated in this Annual were printed in the Transactions of the British Guiana branch of the B.M.A.

Cancer.

How it is Caused. How it Can be Prevented. By J. Ellis Barker. With an introduction by Sir W. Arbuthnot Lane, Bart. London: John Murray. 1924. Pp. 432. 7*s*. 6*d*.

The message of Mr. Ellis Barker is that civilised mankind suffers from constipation, chronic poisoning by the chemicals used as food preservatives, and vitamin starvation, and that this is responsible for much ill-health. This is not new, though the author does his best to make it look new by employing in his writings the polemical methods which are effective in dealing with political and economic matters—subjects which have occupied his attention in the past. He then proceeds to argue that cancer being, as he says, a disease of civilisation, is due to dietetic errors inducing chronic poisoning and vitamin starvation. In supporting his view he produces statistical fallacies which have done duty often for this kind of argument. Mr. Ellis Barker is very ill-informed on the subject on which he writes—apparently as a *self-constituted* authority. If we accepted his statistical fallacies we could use his arguments to prove that cancer is due to an excess of vitamins. For has not in Japan the incidence of cancer increased greatly, while at the same time that of beri-beri has diminished?

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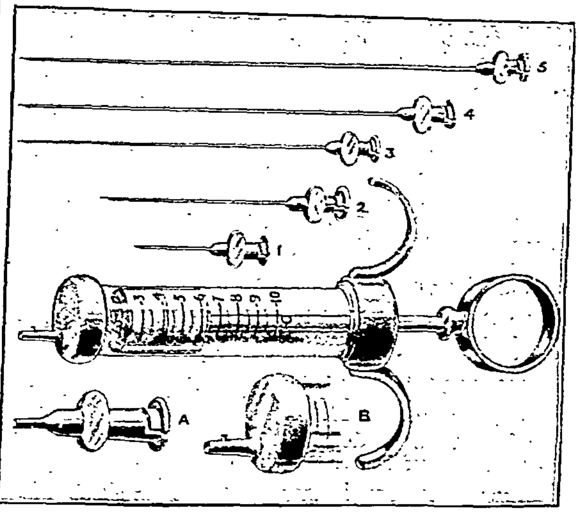

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enough to make it obvious that in this direction alone the method has far-reaching possibilities. He brings forward evidence to show, for example, that mitotic division is not so much the expression of the necessity for cell multiplication as a means by which the cell may adjust itself to altered conditions of environment, and he suggests a valuable field of research for the experimental cytologist. An even more important application of the technique will probably be evolved in the direction of the study of the medium. In other words, cytological studies will not be the only end of "in vitro" cultures, but the growing tissue may serve as a reliable and convenient indicator of the properties of the medium. This implies, of course, a regular and high proportion of successful cultures, and also the possibility of growing tissues in a greater bulk of fluid—in a test-tube, for example. But whatever the future of the method may be, the tissue culture should now pass out of the stage of being a laboratory curiosity and achieve the importance of an experimental technique.

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RATIONS FOR THE INSANE.

THE report of the committee on dietaries in mental hospitals, which is abstracted on p. 81, shows that careful and exhaustive inquiry has enabled definite constructive recommendations to be made. The trouble taken by the committee to obtain relevant information on the practical as well as the theoretical aspect of the subject before coming to any conclusion enhances considerably the value of their proposals. As a preliminary measure the committee asked for and obtained copies of the dietary scales then in force in all county and borough mental hospitals. These were carefully examined, amended by correspondence where necessary, and expressed in terms of caloric values; the final results were submitted to the Quantitative Nutritional Committee of the Medical Research Council for an expression of opinion on their prima facie interpretation. A statement was also obtained from medical superintendents of mental hospitals as to the cost of all such dietaries. Taking as the basis for consideration the accepted food requirements for normal adults, the committee then proceeded, by obtaining anthropometric measurements and other data, to ascertain how far these quantities were applicable to a population of persons suffering from mental disorder; subsequently checking the conclusions by special experiments in basal metabolism, made at the Middlesex County (Springfield) Mental Hospital. Such oral evidence on definite points, as seemed necessary, was then obtained from various sources as—the medical superintendents of some mental hospitals; clerks and stewards deputed for this purpose by the Association of Clerks and Stewards of Mental Hospitals; from the persons in control of kitchens in general hospitals; from the managers, engineers, and cooks of large catering concerns, and from firms supplying kitchen equipment. Visits were paid by the committee, or by some of its members, to a number of mental hospitals, to the kitchens, stores, and cold storages of certain general hospitals, and to modern catering establishments. The chief reasons for these visits were to inquire into the value of certain varying methods in force in different institutions, and to acquire knowledge generally regarding kitchen equipment, the preservation of food, its preparation for table in large quantities, and the means adopted for its distribution whilst hot to considerable numbers of persons. A member of a well-known firm of domestic engineers, who is thoroughly conversant with the apparatus now employed in the preparation, cooking, and distribution of food in mental hospitals in England and Wales, was, moreover, instructed to inquire into arrangements for food preparation and distribution in current use in America and Canada in these hospitals. A model dietary which seemed to meet requirements and be free from the defects in existing scales was then prepared and circulated to the medical superintendents of all mental hospitals with a request for suggestions and estimates of the cost of adopting the model dietary. Detailed replies were received from all of the 95 superintendents to whom the circular was addressed, and were surprisingly divergent. A more exact estimate, founded strictly upon contract prices in force on March 20th, 1924, was obtained from the authorities of a mental hospital in the London district, where more than 1400 persons are fed entirely on food purchased from outside, no home produce being used. The conclusion as to the maximum cost of the diet (8½*d.* and 8¾*d.* per head per day respectively for country and borough mental hospitals) is thus founded on sound premisses. We congratulate the committee on having succeeded in their object of suggesting a dietary that shall be sufficiently adequate for the maintenance of health and vitality and at the same time be a practical proposition.

Annotations.

"*Ne quid nimis.*"

NATIONAL HEALTH INSURANCE: APPOINTMENT OF A ROYAL COMMISSION.

THE appointment of a Royal Commission on National Health Insurance was announced on Monday last with the following terms of reference: To inquire into the scheme of National Health Insurance established by the National Health Insurance Acts, 1911–1922, and to report what, if any, alterations, extensions, or developments should be made in regard to the scope of that scheme and the administrative, financial, and medical arrangements set up under it. The constitution of this Commission is as follows: Lord Lawrence of Kingsgate (chairman), Sir John Anderson, Sir Humphry Rolleston, Bart., Sir Alfred Watson, Sir Arthur Worley, Sir Andrew Duncan, Mr. A. D. Besant, F.I.A., Mr. F. Bramley, Prof. Alexander Gray, Miss Gertrude Tuckwell, Mrs. Harrison Bell, Mr. James Cook, Mr. John Evans, and Mr. William Jones. The secretary of the Commission, to whom all communications should be addressed, is Mr. E. Hackforth, of the Ministry of Health, Whitehall, S.W. 1, and the assistant secretary is Mr. J. W. Peck, C.B., of the Scottish Board of Health. The Commission is fairly representative of the interests concerned, but the President of the Royal College of Physicians of London is the solitary representative of medicine. Mr. Digby Besant has an actuarial experience of medical affairs which make his presence on a Commission very apt.

DISTEMPER.

AN interim report of the activities of the Council for the Study of Dog Distemper was recently issued to the press by Sir Theodore Cook, the hon. secretary. It would appear from the report that the long preparation for the study of distemper is now completed. Buildings for the breeding and rearing of puppies, a hospital for the treatment of dogs suffering from distemper, and a new and properly equipped laboratory have been erected. The last half-yearly report of the Distemper Council intimated that the arrangements for producing "clean" puppies for experimental work were in the hands of Major G. W. Dunkin, M.R.C.V.S., and Prof. J. B. Buxton, F.R.C.V.S. It is now announced that the new laboratories are in the charge of Dr. W. E. Gye, who will be responsible for the experimental work. The enterprise will be watched with the greatest interest by the medical profession. Dog distemper is such a highly contagious disease that only by the most elaborate precautions and by the exercise of the utmost care can the spread of infection be prevented. Previous workers have sometimes had their investigations ruined by accidental or "spontaneous" cases of distemper occurring in control animals; they have all been hampered by the difficulty of obtaining chance of gaining the Royal Assent before the summer holidays, and that the other consolidations dealing with housing and public health will be pressed forward.

The science of town planning has somehow not yet come into its own. The Review of Legislation in 1922, recently published by the Society of Comparative Legislation, shows no great development of town planning in the legislation of the British Dominions overseas. The State of Victoria set up in 1922 a Metropolitan Town Planning Commission with a duration limited to three years and an expenditure limited to £7500. The Commission is directed to inquire into and report upon the conditions and tendencies of urban development and to make recommendations for its future guidance in consultation with the municipalities and public authorities concerned. Its scope is wide, as it is to examine not only roads, traffic and transportation, and water-front and river improvement, but also food supplies and general amenities. The State of Western Australia legislated about rights in light and air. More than 20 years ago Western Australia revolted from the English Common Law and boldly abolished the acquisition of easements of light and air by prescription; grants of such easements were to be restricted to periods of 21 years. In 1922 the restriction was altered. Grants for longer periods were made possible with the written approval of the governor, but no grant is to prevent the erection of a building on the alignment of a street to a depth of 12 feet. After all, even if there is often something irritating about the system of asserting prescriptive rights, light and air are worth preserving. There is, fortunately, less heard at the moment of the architectural experts who want to abolish the London Building Acts and fill the city and metropolis with sky-scrapers. London has afforded few chances of town planning since WREN produced his scheme for rebuilding the area devastated by the Great Fire. If Great Britain is already too congested to give the town-planning expert the opportunities which await him in more spacious countries, the dwellers in our cities must be content with minor mercies. The Public Health (Smoke Abatement) Bill, now being introduced in the House of Lords by the Earl DE LA WARR, may do something to enhance municipal amenities.

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RECENT DEVELOPMENTS IN TISSUE CULTURE.

IT is a remarkable thing that although the possibilities of tissue culture were demonstrated more than 20 years ago, the technique has hardly emerged from the experimental stage. We do not yet know whether we have in the method a means of solving certain fundamental biological questions which other lines of investigation have failed to answer, or merely a barren though brilliant laboratory technique. Many workers, of course, have successfully cultivated tissues outside the body, and it would seem that with proper precautions such cultures may be propagated practically for ever. The histological structure of the culture may be modified by various means, and its rate of growth accelerated or diminished; but beyond these somewhat primitive observations it is disappointing to record that very little has emerged. The technique is undoubtedly tedious and difficult; but all was not plain sailing for the early bacteriologists, and one cannot help feeling that in their attitude towards "in vitro" culture biologists have exhibited something of that "lag" which is so familiar in the cultures themselves. Fortunately there are indications that this period of neglect is at an end. The conviction is steadily growing that tissue culture is a really valuable experimental method, one which should be a commonplace in every pathological or biological institute, rather than a field of endeavour for the more adventurous pioneers.

Mr. T. S. P. STRANGEWAYS has placed laboratory workers under a debt of gratitude, for in two recent publications[1] he has, as it were, lifted the veil of mystery and placed the technique of tissue culture on a sound practical footing. In these little books he describes the method of carrying out tissue culture and some of the results he has obtained. In the book on technique he discusses, with admirable clearness and with the utmost attention to detail, every step in the manipulation necessary to procure satisfactory cultures. No point is too small to escape his notice; in fact, at times he seems to border on the meticulous. But it may be supposed that he does not write thus without very good reasons. In his preface he says: "The beginner will doubtless be tempted to modify the technique recommended in this work, especially if after a few trials he fails to obtain satisfactory results. The writer would, however, urge him to wait until he has succeeded in cultivating tissues by the methods described before he attempts any original improvements." And it is not difficult to read between the lines. Any variations in technique, if they are to be of value, must be the outcome of an accurate and practical knowledge of the methods now in vogue. Such knowledge is obviously possessed by Dr. THOMAS LUMSDEN, who in this issue of THE LANCET draws attention to what appears to be an extremely satisfactory method of growing tissues in vitro. Instead of using plasma or an artificial synthetic solution as his culture medium he employs serum, with excellent results. He has been successful where others have failed because he has recognised that the pH of the medium is of the utmost importance, and that serum rapidly becomes impossibly alkaline on exposure to the air by the loss of CO_2. By avoiding such exposure, the pH of serum remains below the necessary limit of 7·7, and tissues will grow in it with great readiness. The importance of Dr. LUMSDEN'S work is undoubted, for it has long been obvious that a profound simplification of the technique would be a necessary preliminary to the general adoption of tissue culture as a routine method of investigation rather than as an end in itself. No laboratory procedure which requires a minimum apprenticeship of four months can ever become popular, nor on the face of it would such a prolonged training seem necessary. After all, the basis of the method has been firmly established in the last few years. All authorities insist upon the necessity for the most rigid asepsis, but this should not be so difficult to achieve. Our modern medical curriculum must be gravely at fault if, at the end of it, the theory and practice of asepsis are not so deeply ingrained in the student as to become a second nature to him. Ordinary technical skill, combined with a sound laboratory training, should fit anyone to undertake tissue culture work; and though success may come to some investigators more easily than to others, we cannot believe that it is not within the reach of all.

In the second of his recent publications Mr. STRANGEWAYS deals with some of the more important observations he has made on the growth and behaviour of the normal cell, and the cell modified by various agencies, in cultures outside the body; and he tells us the dogs fell to 32·3° C., or, on the other hand, rose to 42·5° C., were not productive of serious mischief, and after the animal's return to its stall at 27°–28° C., the body temperature quickly regained its approximate normal. A rise of temperature (vaginal) reaching 43·2° C., productive of delirium, profuse salivation, and acute symptoms of distress, was yet rapidly recovered from on removal to cool surroundings. It would seem, therefore, that even in high paraplegia, thermometry at somewhat frequent intervals can, as M. S. Pembrey has pointed out, notify over-stress of thermotaxis in ample time for the taking of successful measures of relief.

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[1] The Technique of Tissue Culture "In Vitro." Cambridge: Heffer. 1924. Pp. 80. 7s. 6d. Tissue Culture in Relation to Growth and Differentiation. Same publishers. 1924. Pp. 50. 5s.

THE PAPWORTH VILLAGE SETTLEMENT.

AN extension of the Papworth Village Settlement was declared open on Tuesday last by the Duke and Duchess of York when a large and representative company were present. The Settlement is the practical realisation of a scheme which in its inception seemed highly imaginative or Utopian, and its value may lie as much in the example which it sets to other communities as in the practical good which it has been able to do for a certain number—now quite a large number—of sufferers from tuberculosis. The objects and the activities of the Papworth Village Settlement have been frequently noted in these columns as well as in the lay papers, and we may assume that they are quite familiar to our readers; but that sort of familiarity is as nothing compared with the appreciation of the work which will follow a personal visit. We strongly recommend anyone who has the opportunity to make an inspection of the Settlement to seize it and acquaint himself with the all-round manner in which a class, that may be among the unhappiest which modern sociology knows of, can live active and healthy lives and earn good wages, if the initial safeguards are provided, and the risks of protracted unemployment are removed. Dr. P. C. Varrier-Jones, who may be addressed at Papworth Hall, Cambridge, will give every facility for inspection, and previous reference to the description of the movement, written by him and Sir Clifford Allbutt in our columns, will be found a useful preparation for a visit (THE LANCET, Oct. 20th, 1923, 913). At the annual conference of the National Association for the Prevention of Tuberculosis, it will be observed from our report this week that the Papworth Village Settlement is regarded by experts as an acknowledged success.

THE CONDITIONS OF INDUSTRIAL EFFICIENCY.

THE Industrial Fatigue Research Board has acted wisely in publishing a short summary[1] of the conclusions arrived at in the various reports issued by the Board during the past six years. Results obtained in specific investigations tend to be forgotten, except by those interested in the particular industry, and may escape even their notice. Yet they form, when taken together, an organic whole, as may be perceived from this summary, with at least one common factor—human activity. The industries from which results have been culled include the great textile group, the metal industries, boot and shoe making, pottery manufacture, the glass and laundry trades, and repetition work. The findings are subgrouped according to (*a*) working conditions, (*b*) working methods, (*c*) administrative matters. The accumulated evidence goes far to establish that maximum output is contingent on maximum fitness of the individual worker, and that this can only be attained by providing the most hygienic and comfortable conditions and methods of work. Indications of the ways to effect at any rate improvement arise from each study. The recommendations are of different kinds. Some merely suggest promising new fields of research in which no work has yet been carried out; others advocate the adoption of certain practices with a view to the accumulation of useful data; others, again, deal with the applications to industry of the results already disclosed. Most of the recommendations have been put forward with the concurrence of representatives of the industries concerned, and it is hoped by the Board that these industries will give careful consideration to the question of giving them practical effect. Analysis of the investigations of the Board grouped by subject-matter—i.e., ventilation, lighting, or noise—is needed to establish clearly the law and order of the conclusions; such analysis is contemplated by the Board and its appearance will be welcomed.

SPECTACLES FOR SHOOTING.

THE article which we publish in another column on vision and target shooting by Mr. Wynn Wirgman explains the optical problem of correcting an error of refraction in a rifle shooter who lies in the ordinary prone position and shoots with his right eye. In this position the line of sight passes not through the mathematical centre of the correcting lens but through a point in its upper and inner quadrant. The result is that, owing to the prismatic effect of the lens, the image is displaced, and when the error of refraction is as much as five dioptres, as in some of the author's cases, the displacement may be considerable. Hence it is necessary to centre the glass so that the line of sight passes through the optical centre. To prevent distortion it is also necessary to ensure that the plane of the glass is parallel with that of the target. It is of interest to read that, acting on these principles, Mr. Wirgman has prescribed glasses for as many as 38 men who have been or are really good shots. Of course, for ordinary purposes these glasses would be quite unsuitable. The correction of refraction is thus not always the merely mechanical problem that it is sometimes supposed to be.

ANALYSED MORTALITY.

AT a meeting of the Faculty of Actuaries on June 30th Mr. Eric B. Nathan, F.I.A., read a paper entitled Analysed Mortality: The English Life Tables No. 8A. Using the census data (England and Wales) of 1911 and the deaths registered in 1911 and 1912, Mr. Nathan has constructed for each sex separately the rate of mortality (q_x) curve for each of 20 groups of diseases. It is therefore possible to display graphically the share of each group in the total mortality at any age and to follow the change in importance of each group throughout life. The curves are of much interest as some of the groupings have not been adopted before, and so detailed a study of the data derived from a short period is not available. Mr. Nathan does considerably less than justice to the General Register Office when, speaking of pulmonary tuberculosis and cancer, he remarks that "my attention was brought to the fact that even to-day there was no definite measure of the mortality due to these two scourges of the youth and middle ages of the people of this country, although partial investigations had been made, such as those of Messrs. Teece, King, and Newsholme, and more recently those of Dr. Brownlee and Profs. Karl Pearson and Arne Fisher." As a matter of fact, rates of mortality at ages in quinquennial groupings for tuberculosis, pulmonary and other forms, and for cancer, with distinction of sites, have been regularly published by the Registrar-General and commented upon by Dr. T. H. C. Stevenson for many years. It is true that in official publications the rate of mortality used is what actuaries term the Central Death Rate, and the rates have not been smoothed or graduated. But the actuary's Rate of Mortality can be easily deduced from the Central Death Rate (except at the ends of life, it does not differ from it very substantially in magnitude), and there are not many medico-statistical purposes for which a graduated function is essentially superior to the crude rates. So far, indeed, as tuberculosis and cancer an adequate supply of healthy puppies which had not suffered from distemper and had never been exposed to the risk of infection. It is indeed probable that the first generation of puppies, reared under conditions which exclude the possibility of distemper infection occurring, will not prove entirely satisfactory. An inheritance of partial immunity may well complicate the experimental study. The second and later generations become progressively more susceptible to the disease and consequently are more suitable for the work in hand, but it will take a long time to obtain such puppies. Patience is thus demanded even for the provision of material for study—the routine part of the work. The real difficulties will begin with the attempts to isolate the causal organism. It is commonly believed that the organism belongs to the group of "filter-passers," but this is by no means certain, as recent work in Japan[1] has shown. The first step in the research must be to show conclusively whether the distemper virus is filterable or not. The tedious, but necessary, preliminaries to this task appear to have been overcome; the laboratories and kennels are well equipped, through the generosity of the subscribers to the Field Distemper Fund, and the work is being carried out under the best possible auspices with good chances of success. May good fortune attend it.

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[1] Results of Investigation in Certain Industries. Industrial Fatigue Research Board. Report No. 17. H.M. Stationery Office. 1924. Pp. 17. 6d.

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

THE fifth annual general meeting of the Society was held on July 10th, Sir Auckland Geddes presiding, in succession to the late Lord Willoughby de Broke. In an interesting address outlining forcibly the necessity for a regulated frankness especially at the educational period with reference to venereal disease, Sir Auckland Geddes indicated the value that might accrue from the union of the Society with the National Council for the Control of Venereal Diseases in one strong body, but he said that the value of such a union would be damaged if the result were "to diminish the weight of the attack on the causal organisms of venereal diseases." He then moved a resolution embodying a request to the Ministry of Health for the allocation to the Society of a fair share of any money set aside for the education of the public regarding venereal diseases and their prevention. Mr. Wansey Bayly then laid before the meeting details of the work of the Society during the past year when other members of the executive present spoke from various points of view as to the work of the Society and the need for its official recognition.

TEMPERATURE REGULATION AFTER SPINAL TRANSECTION.

A CONTRIBUTION by Prof. C. S. Sherrington, P.R.S., to the current number of the *Journal of Physiology*, modestly entitled Notes on Temperature after Spinal Transection, with Some Observations on Shivering, contains amongst other matters important observations on impairment of temperature regulation in paraplegic dogs which for other reasons were kept for relatively long periods. Severance of the spinal cord was in every case performed under deep anæsthesia and with full precautions against sepsis. In some animals the spinal transection was situated as far forward as the cervical region. The impairment of thermotaxis remains severe long after complete subsidence of the acute symptoms of "spinal" shock. A normal dog, lightly anæsthetised and immersed up to its middle in ice-cold water for 10 minutes, showed a fall of mouth temperature from 37·6° to 37·2° C. A small dog similarly immersed 530 days after spinal transection (first thoracic level) showed a fall of mouth temperature from 37·9° to 33·9° C. Immersion under the same conditions of an unanæsthetised normal dog of 4 kilos weight brought the mouth temperature from 37·9° down to 37·2° C. in 18 minutes, while a repetition of the procedure on this same dog 30 days after spinal transection at the sixth thoracic segment brought the mouth temperature from 37·5° down to 35·8° C. in 18 minutes. It is known that the degree of impairment of thermotaxis in paraplegia is proportioned to the extent of the paralysis—i.e., is greater the further forward the seat of spinal severance. Experiments are quoted in detail upon dogs with severance at levels between the seventh cervical and third lumbar, and at periods subsequent to the transection varying from 21 days to 589 days to exemplify this relationship. As to cold shivering in the paraplegic dog, von Goltz considered the shivering to be spinal. Charles Richet, however, in 1893 noted that in the chloralised dog severance of the spinal cord at once confined the field of shivering to muscles headward of the spinal transection, and concluded that shivering requires a pre-spinal nervous mechanism. Sherrington and Laslett in 1903 instanced a dog retaining excellent health for 580 days after exsection of the eighth cervical spinal segment, in which free shivering, when the dog was cooled, occurred headward of the lesion, but no trace of shivering ever trespassed backwards to the muscles innervated from behind the lesion. Shivering in other dogs was absent from the paraplegic region as completely a year and a half after spinal severance as at first, and was so although the usual spinal limb and other reflexes, cutaneous and deep, were brisk and the femoral pressure as high as 122 mm. Hg. The non-appearance of cold shivering in the paraplegic region of the dog can reveal with great clearness the exact segmental level of the spinal lesion by demarcating the muscle field innervated behind the lesion from that in front—indeed, the boundary will actually subdivide an individual muscle—e.g., the anterior part of the deltoid will shiver violently when in its posterior part no shivering can be evoked. In paraplegic man also shivering fails below the lesion and could exhibit the segmental level of a traumatic lesion. Spinal transection impairs the dogs' adjustment to heat as well as to cold. The absence of heat-sweating in the paraplegic region is well known, although profuse sweating unrelated to heat may occur in the paraplegic region in patients as a spinal reflex. Summing up what he calls "these admittedly desultory observations," the author finds that in dogs long after complete subsidence of spinal shock, as judged from usual post-transection reflexes, there persists in the region innervated from behind the transection marked failure of adjustment of the surface blood-supply (paws, *pinnæ*, nose) to changes of surrounding cold and warmth. The failure of this vascular adjustment, though not absolute, remains severe and without improvement; along with it there is complete abeyance of sweating to heat and in muscles complete abeyance of shivering to cold. Diurnal fluctuations of 2° C. in the stall temperature affected conspicuously the vaginal temperature of cervical paraplegic dogs fully removed from spinal shock. In dogs all attempts, even after considerable exposure, to induce cold shivering in the paraplegic region as a spinal reflex entirely failed. On cold immersion of the insentient paraplegic portion of the dog, shivering occurred headward of the spinal lesion even when the skin headward of the lesion still felt, to the touch, fully "warm." Shivering under these circumstances is, on older views of the nature of the adequate skin-stimulus for "cold" difficult to explain as a reflex, but it is not precluded from being reflex on the views propounded by Ebbecke (1917) for the nature of the adequate skin-stimulus for "cold" sensation. On the other hand, shivering under these circumstances may be possibly of deep origin from direct cooling of a central (diencephalic) thermotaxic mechanism. Shivering seems not to require the afferent nerves of the lung or of the shivering muscles. Shivering reflex or "central" requires, like Richet's heat polypnœa, some central nervous mechanism anterior to the mid-brain. Instances where, under severe but short-lasting changes of surrounding temperature, the body temperature (vaginal) of household, fire, and motor car insurances; and with regard to the last, a special service now offered by the Agency has met with considerable approval. A tentative agreement between the Agency and Messrs. Mann, Egerton, and Co., Ltd., has been arrived at, by which that well-known firm places its services at the disposal of doctors insuring through the Agency; and as this scheme develops, and members become aware of it, what is now a promising start in the way of placing a reliable motor service organisation at the disposal of the M.I.A. will develop into a substantial bureau of advice to that large and increasing number of doctors who find the use of a motor car essential to their work. The rebates to doctors insuring through the Agency amounted during the year 1923 to over £2000, and the surplus from the income and expenditure account stood at the end of the year at £1595 14s. Interim grants amounting to 750 guineas were made to the Royal Medical Benevolent Fund (£210), the Royal Medical Benevolent Fund Guild (£210), Epsom College Benevolent Fund (£105), and the Royal Hospital and Home for Incurables, Putney (£52 10*s.*). A sum of £210 was added to the Educational Grants (Girls) Fund. As a result of this distribution, the total sum subscribed to medical charities by the Medical Insurance Agency since 1910 has reached £12,250.

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[1] THE LANCET, 1924, i., 1011.

TREATMENT OF ECLAMPSIA.

WE would call the attention of practitioners to the offer made by Prof. B. B. Stroganoff on p. 62 to give his services by day or by night during the next six weeks in treating any cases of eclampsia by his well-tested method. In the last 253 patients treated by this method only six deaths supervened, and these were in cases neglected before the method was applied. Senior members of the obstetric staff of general and special hospitals have already been informed of Prof. Stroganoff's readiness to treat cases, and also members of the Section of Obstetrics and Gynæcology of the Royal Society of Medicine who live in London. Prof. Stroganoff's address is 98, Philbeach gardens, Earl's Court, and his telephone number is Western 2029.

R.A.M.C. WAR MEMORIAL FUND.—The General Committee of the Royal Army Medical Corps War Memorial Fund will meet at the War Office (Room 219) on July 17th at 4.45 p.m., to decide as to the final disposal of the balance of the Fund.

INTERNATIONAL CONFERENCE ON TROPICAL HEALTH PROBLEMS.—Sir W. Arbuthnot Lane, Sir William Simpson, Sir Leonard Rogers, Sir James Kingston Fowler, and Dr. Aldo Castellani will attend this Conference, which is to be held at Kingston, Jamaica, from July 23rd to July 31st.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—At a meeting of the board of the hospital, Prince Arthur of Connaught in the chair, on June 2nd, the Dean, Mr. A. E. Webb-Johnson, announced that the sum of £20,000 had been given by Mr. Samuel A. Courtauld to endow the University professorship of anatomy in the medical school of the hospital.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

THE LANCET OF FEB. 2ND, 1924.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXIX.—THE TREATMENT OF CEREBRAL VASCULAR LESIONS.

THE term "apoplexy," if used in its classical sense, denotes a state of unconsciousness with complete paralysis, except of the vital functions, developing more or less suddenly as the result of blockage or rupture of a cerebral artery. Its onset is sometimes instantaneous, but is usually preceded by premonitory symptoms, such as headache, giddiness, abnormal sensations in or weakness of a limb, or disturbance of speech, which may last for a few minutes or days. Consciousness may be lost slowly or rapidly. The patient lies in a state of coma, breathing stertorously, with a pale or cyanosed face and flaccid limbs. He may never recover consciousness, death occurring quickly or within two or three days. Recovery when it occurs is gradual and is marked by a stage of irritability in which the patient resents interference of any kind. Ultimately he is left with some gross disturbance of function, most commonly hemiplegia.

The apoplectic attack may, however, be less severe and consist of little more than momentary loss of consciousness or giddiness, associated with hemiparesis or aphasia which may disappear in a few weeks.

Sometimes coma supervenes after paralysis has appeared, and frequently a stroke consists solely of a slowly developing hemiplegia that may become complete without any disturbance of consciousness. To an attack such as the latter the term "apoplectic" should not strictly be applied, but the original meaning of the word is now rarely adhered to. The majority of apoplectic seizures occur in patients over 40 who are suffering from arterio-sclerosis with or without arterial hypertension, cardiac hypertrophy, and renal disease. Hæmorrhage or thrombosis is the immediate cause, and one of the branches of the middle cerebral is most commonly affected. A stroke occurring in a young adult is very frequently due to syphilitic arteritis, and sometimes to embolic occlusion or rupture of a basal aneurysm.

Theoretically, it would seem to be important for the proper treatment of vascular lesion of the brain to differentiate cases of hæmorrhage from those of occlusion especially by thrombosis. And the matter might not appear to present any difficulty when the state of the heart and blood pressure can be used as an index. But pathological experience teaches that in many cases, perhaps the majority, it is impossible at the bedside to be certain of the nature of the lesion. In general, embolism is usually the cause in young people with simple or infective endocarditis; between the ages of 20 and 40 thrombosis from syphilitic arteritis is most common, and after 40 either thrombosis or rupture may occur. With embolism or hæmorrhage the onset is usually sudden in a patient with high blood pressure, hypertrophied heart, or renal disease, whereas thrombosis often develops slowly with premonitory symptoms lasting perhaps for hours and frequently occurs in the night. But the lesion may be thrombotic when the left ventricle is hypertrophied, the pulse is full and bounding, and the blood pressure is raised; on the other hand, it may be hæmorrhagic when these signs are absent. Nor is the mode of onset a sure guide, for with thrombosis, while the development of the seizure is usually slow, it may be apoplectiform, and with a small rupture the opposite may occur. The broad rules of treatment should therefore have a general application whatever the immediate cause of the vascular lesion may be.

General Management.

For a patient who is in an apoplectic seizure, or who has the slightest warnings of one, absolute rest is the are concerned, Mr. Nathan's results have been rendered obsolete by official publications. This is not to say that Mr. Nathan's paper is untimely or uninteresting. In fact, it presents important data in a light which will be novel, but quite intelligible, to many medical readers and should receive the special consideration of the medical advisers of assurance offices.

THE STRUCTURE OF ENAMEL.

THE structure of human enamel has attracted much attention from dental histologists and has aroused much controversy. In the past the view has been generally held that enamel was an entirely inorganic tissue, and therefore could only play a passive rôle in the production of dental caries. Latterly it has been suggested that enamel may not be so devoid of organic matter as had been thought and that it might conceivably play an active part, either in predisposing to dental caries or in aiding the individual to resist the disease. The extreme hardness of this tissue has made its investigation one of much difficulty; histological evidence appeared to show that its organic content, if it existed at all, must be extremely slight. On the chemical side, the work of C. S. Tomes was accepted as indicating that organic matter was absent. Against this must be set the more recent work of Lovatt Evans, who, using the most modern analytical methods, found that enamel contained from 1 to 2 per cent. of organic matter. Hitherto it has only been possible to prepare sections of enamel by grinding. In the hands of Leon Williams some wonderful results were obtained, but it is obvious that such a method would fail to reveal any organic structure, if such really existed. The latest histological investigation by H. C. Malleson,[1] marks a notable advance in microscopical technique, for he has been able to decalcify enamel and to cut sections on a microtome after embedding in celloidin. Malleson finds that either citric acid or trichloracetic acid to which alcohol is added, allows the enamel to be decalcified without destroying its structure. The process is a long and tedious one, but the results are of great interest, for sections prepared in this way show a different structure from ground specimens. As is well known, enamel consists of prisms embedded in a small amount of cementing substance. Malleson finds that after decalcification a prism cuticle remains. This surrounds the prisms, and in transverse section is oval in shape with evidence of a longitudinal groove. This cuticle stains deeply with hæmatoxylin and is considered by Malleson to be organic in nature. Whether this interpretation is correct or not, the work marks a notable advance in histological technique, and should materially aid further investigation of the enamel. A study of the micro-photographs as well as of the actual sections, suggests that if Malleson's view be correct, the amount of organic matter must be considerable, far more than 1 or 2 per cent. That does not invalidate Malleson's view, though it suggests the possibility that even prolonged immersion in acid by his method may not entirely remove the lime salts, and that some of the residue may still be inorganic.

TYPES OF PNEUMOCOCCI IN NORWAY.

IN the May number of *Norsk Magazin for Laegevidenskaben*, Dr. T. Thjötta and Dr. O. Hanneborg have published an interesting comparison between the distribution of the various types of pneumococci in the U.S.A. and in Norway. With regard to the former country, it may be remembered that the work of the Rockefeller Institute in New York showed type I. to be present in 33·3 per cent., type II. in 29·3 per cent., atypical type II. in 4·2 per cent., type III. in 13 per cent., and type IV. in 20·3 per cent. The Norwegian investigators have followed the same technique as that of the Rockefeller Institute's hospital, and have employed sera provided by this hospital and the New York Board of Health. In the course of a couple of years they examined the sputa of 100 cases of pneumonia and they found type I. in 44 per cent. of their cases, type II. in 32 per cent., type III. in 6 per cent., and type IV. in 17 per cent. It will thus be seen that the numerical proportion of the various types of pneumococci is approximately identical in the two countries. In the Norwegian material there were only eight deaths, and this mortality of 8 per cent. is in striking contrast to the mortality of 30 per cent. recorded in the U.S.A. before serum treatment was started at the hospital of the Rockefeller Institute. The Norwegian figures are, of course, too small for such a comparison to be fair. With regard to the virulence of the various types, the Norwegian investigators confirmed the observations made in the U.S.A. that type III. must be considered the most dangerous; in the Norwegian material it was responsible for a mortality of 16·6 per cent., whereas the mortality for type I. was only 9 per cent., and that for types II. and IV. only 6 per cent. Fortunately, type III. is comparatively rare, and it is type I. which, owing to its relatively great frequency, plays a most important part both with regard to mortality and complications. In the Norwegian material 11·3 per cent. of the cases of pneumonia, caused by type I., were complicated by empyema—a complication not once seen in the cases of pneumonia in which type III. was found. Dr. Thjötta and Dr. Hanneborg have also studied the mortality rates from pneumonia in Norway since 1876, and they have come to the conclusion that the average is about 15 per cent. It is interesting to note that the yearly fluctuations of these rates throughout the country were much greater in individual hospitals—even large hospitals—than in the whole country; the hospital rates ranged from 10 to 34 per cent., whereas throughout Norway they ranged only from 13 to 18 per cent. It would be interesting to learn the reason for the mortality from pneumonia being approximately twice as high in the U.S.A. as in Norway. May it be that the stationary and homogeneous population of Norway is more resistant than the migrant and heterogeneous population of the U.S.A.? Dr. Thjötta and Dr. Hanneborg suggest that light might be thrown on this matter if information could be obtained as to the mortality from pneumonia among Norwegians settled in the U.S.A.

THE MEDICAL INSURANCE AGENCY.

A MEETING was held of the Committee of Management of the Medical Insurance Agency on June 26th, Dr. R. Langdon-Down being in the chair, in the absence through illness of Dr. G. E. Haslip. The secretary of the Agency, Mr. L. Ferris Scott, presented the audited balance-sheet for the year ended Dec. 31st, 1923, with the chairman's report, and a detailed statement made of the progress of the Agency during the last eight years. The report showed that the Agency had been able to live up to its record of introducing over £100,000 worth of new business per annum, a record established now four years ago; for in 1923 life assurance policies, totalling £101,097, were obtained, the money being assured under 102 policies, and representing a yearly premium income of over £5000. It will be of interest to those who have not happened to watch the activities of the Agency from the beginning to learn that the total sum assured through its medium, since its inception, amounts now to over three-quarters of a million sterling. The continuance of the progress in the premium income of the Agency was shown in the report by the following figures: In 1907–08 the premium income was about £1000; in 1914 it had reached £11,000; in 1922 the figure had increased to £38,000; and in 1923 the net premium income was £47,823. These are big figures for an Agency which confines its activities to one profession. An increase of business was shown during the year in the combined

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[1] Brit. Dental Jour., May 15th, 1924.

Special Articles.

VISION AND TARGET SHOOTING.

BY C. WYNN WIRGMAN, M.D. LOND., F.R.C.S. ENG., T.D.,

LATE OPHTHALMOLOGIST, 17TH GENERAL HOSPITAL.

THE sport of rifle-shooting is by no means so popular in the British Isles as in the Overseas Dominions. There are several reasons that may be suggested, but no doubt the principal one is that Government encouragement is lacking. In the Dominions, Government support is hearty, and in consequence many more enthusiastic rifle shots are to be found. Still, there are many here who are constant visitors to Bisley, and the "King's" winner is a person of some small consideration. I therefore venture to make a few observations on the subject of sight in rifle-shooting and the special requirements for shooting spectacles.

The Essentials of Marksmanship.

Attainment of a high standard of marksmanship results from a combination of physical qualities, to which must be added certain mental characteristics as well. The public believe that good eyesight is the one great factor, but in this they are not quite accurate. Ability to see the object aimed at is certainly necessary, but not perfect vision. Fatigue of the eye, I think, and not bad definition, is the main cause of the difficulty in scoring well for a number of consecutive shots, as required in present-day competitions. I have had the opportunity of examining the eyes of many of the Bisley competitors, and it is upon these observations that this note is based.

Many of the younger men, although not emmetropic, do not feel the need of glasses so much, because fatigue is not so easily felt in youth where the application is not constant and intense. In Bisley shooting there is an interval for rest between each shot, possibly as much as two to three minutes when three competitors are firing at the same time.

Visual Defects in Shooters.

I have prescribed spectacles for 38 men who have been, or are, really good shots. Of these I find 22 were hypermetropic, 15 needing spheres only, and 7 cylinders with or without an additional sphere; 10 were myopic, and all but one of these needed cylinders as well as spheres: 6 showed mixed astigmatism. The greatest amount of manifest hypermetropia found was +1·50 sphere and of myopia −5·50 sphere. The strongest minus cylinder was −1·50 (no sphere). Among the hypermetropes I have no note of a cylinder exceeding +·75.

The Use of the Eyes in Shooting.

In shooting two points have to be observed and aligned—viz., the mark and the foresight. In old days one would have added a third, the backsight. Nowadays the aperture sight has made this an automatic part of the alignment, and incidentally has increased the ease and rapidity of aim and shooting to a very great extent. It has also aided those with defective vision by diminishing the cone of rays. The average size of aperture used is 0·05 in. to 0·08 in., or even in some cases 0·1 in.

The majority of shooting men at the moment of firing focus the tip of the foresight, which, in the short service rifle, is approximately 32 in. from the eye. Before the final pressure is applied the attention is concentrated on maintaining the relative position of the point of aim and the tip of the foresight. I say point of aim advisedly, for some men take what is known as "a six o'clock" aim—i.e., the tip of the foresight just below the mark, others aim at the top of the target, and others at the bottom. The eye, therefore, while aiming is alternately relaxing and accommodating, finally settling for a fraction of a second in partial accommodation. It can, then, be readily understood that errors of refraction tend to cause fatigue in older shots, particularly on sunny days or when many shots are fired consecutively. Add to this the strain of using a telescope to mark the "spotting disc" and to judge the wind by the mirage and we see the main value of the correction of faulty refraction is not so much to *see* the object aimed at well, but to put the eye under the best conditions for hard use.

Correction of Visual Defects in Shooters.

In prescribing glasses the point to which I wish to draw attention is that an ordinarily centred lens is not advisable, because in the position assumed when firing the eye looks through the upper and inner quadrant of the lens. (The match rifle-shot who usually assumes the supine position is not in question, only the service rifle user.)

In the prone position the body is carried well away to the left, so that the head is inclined to the left also in the act of looking at the mark. The face is inclined at a more or less acute angle to the ground, and the right eye is slightly further from the target than the left (in a right-handed man). This necessitates the line of vision passing, as has been pointed out, through some point situated in the upper and inner quadrant of the right lens, and, if no alteration of centre is mentioned in the prescription, a prismatic and curved image is produced. To counteract this it is necessary (*a*) to raise the frame; (*b*) to centre the glass so that the line of aim and the optical centre coincide; (*c*) to bring the face of the glass parallel in the vertical plane with the target.

Theoretically the shooting glass should be angled to correspond in the horizontal plane also, but in practice this is hardly needed. It will be found that an angle of 10°–15° back from the vertical is required to fulfil (*c*). An angling joint can be used for this.

The question of the lens employed for the left eye is also of some importance. As most men shut the left eye while aiming, it might be thought that a monocle would be most convenient (with due provision for the correct axis of any cylinder used). Most men use the left eye for telescopic purposes, as mentioned above, and for this a normal centring is sufficient in a toric lens. Seeing, however, that whether the normal distance between the pupils is preserved in the centring, or whether the eyes are supposed to be used independently, the optical centres and the pupils will not correspond when the subject is walking about, it is as well to warn him to wear the glasses only when in the shooting position. With a strong minus lens the decentring causes the lower edge to be very broad, and it is as well either to order a lens smaller than usual in diameter or to cut away the lower half. With some types of aperture sight the latter is, in any case, an advantage, as the recoil sometimes brings part of the sight in contact with the base of the frame.

The glasses for big-game and game-bird shooting need not, I think, be brought under the above rules. Shots with the sporting rifle are not always taken in the prone position, and in any other position the eye is not rotated so much away from the centre of the frame; while the shot-gun user needs certainly to see his mark, but his alignment of the gun upon it is dependent very slightly on aim. Instinctive muscular control directs the barrels just as in revolver snap shooting. The proper fitting of a shot-gun to the individual's anatomical construction is nine-tenths of the making of a good game shot. In the military rifle no more than a certain alteration in the length of the stock is possible.

Much remains to be learned of the physiology of rifle shooting, both with regard to vision and psychology. The causes of bad shooting are legion, and it is not always easy to assign the proximate cause. On the whole I am inclined to think that vision is by no means the chief factor in the equipment of the great shot, but is only one of many.

first essential. He should be put to bed with as little disturbance as possible, his room kept quiet, and the light dim. His head and shoulders should be slightly raised on a pillow, care being taken that the large veins of his neck are not being pressed upon.

If the patient is conscious, visitors should be prohibited, and he must be protected from worries and physical exertion. He ought to be fed, and must not be allowed to alter his position in bed by his own exertions. A bedpan and urinal must be employed. If the patient is unconscious he should lie on his side, preferably on a water-bed, and the nurse must see that his head does not drop forward. He may be incontinent, but if urine is retained catheterisation will be necessary and should be carried out with minimal disturbance of the patient. His skin must be cleansed with soap and water night and morning to prevent the development of bedsores, and for this purpose the nurse should use the palm of her hand. After carefully drying his skin with a rough towel, she should gently rub his back, shoulders, and buttocks with methylated spirit, and finally dust them over with boric powder. If the patient is in a restless, semi-conscious state sedatives are necessary and, provided that he can swallow, bromides or chloral, or both combined, are preferable. As a draught the following is satisfactory: Pot. brom., 20 gr.; chloral hydrate 12 gr.; aq. menth. pip. ad 1 oz. Morphia is a depressant of the respiratory centre, but in the circumstances under which it would be called for this is no deterrent to its use in moderate doses. For restlessness is not usually associated with deep coma or other signs of increased intracranial pressure sufficient to impede medullary function.

Feeding.—Whether the stroke is severe or slight it is safe and probably wise to starve the patient for the first 24 hours. If he is conscious and thirsty he should be allowed sips of water but not large quantities of fluid. If he is unconscious, care must be taken to keep his mouth clean by swabbing it out with a mild antiseptic or alkaline lotion. After the first day semi-fluid diet can be given if necessary in the form of nutrient enemata. If the patient is feeble and his heart's action is poor, alcohol and digitalis are often beneficial. Even in mild cases the diet for a few days should be light and then gradually increased. When it is clear that the cause of the stroke is rupture of a vessel it is generally considered to be good practice to promote free action of the bowels by calomel or croton oil ♏ i., followed by an enema. If the vascular lesion is clearly thrombotic, and especially if the heart's action is weak, purgatives should be avoided, but enemata and mild laxatives can be used.

Where there is good reason to believe that syphilis is the cause of the arterial disease, anti-syphilitic treatment should be early instituted. Since it is important to disturb the patient as little as possible, it is necessary carefully to choose the drug to be employed and the method of its administration. Mercury by intramuscular injection is perhaps preferable, although arsenical compounds such as glucarsenol or sulpharsenol can be given in small doses into the buttock at weekly intervals under strict aseptic conditions. As soon as the patient is able to swallow, pot. iod. gr. x. to gr. xx., thrice daily, should be given.

Are Surgical Measures Justifiable?—Many of the clinical phenomena resulting from cerebral vascular lesions are due to raised intracranial pressure from hæmorrhage and œdema or œdema alone. When coma is deep or increasing the question therefore arises whether or not active measures ought to be adopted to relieve the cerebral compression that otherwise may kill the patient. It is a question by no means easy to answer. If, in addition to profound coma, there is clear evidence of disturbance of medullary function, such as rising blood pressure associated with Cheyne-Stokes respiration and cyanosis, relief of intracranial pressure is certainly necessary, for otherwise the patient is likely to die. As to the best method to adopt, bleeding by phlebotomy at one time played a prominent part in the routine treatment of apoplexy, and if sufficiently heroic it will certainly lower the intracranial pressure. But nowadays it is rarely employed. This is not to be wondered at, for it has only a limited usefulness and under certain circumstances may be positively dangerous. Thus when the circulation through the medulla is already enfeebled from either cardiac weakness or compression it is likely quickly to lead to a fatal result. Even in cases of cerebral hæmorrhage in which the heart is acting forcibly, the blood pressure is high, and respiration is not embarrassed. Although withdrawal of blood is unlikely to be harmful, it is doubtful whether any real benefit will result from it. Venesection on the whole has little to commend it.

Withdrawal of spinal fluid by lumbar puncture is sometimes employed, but where the pressure within the skull is sufficiently great to affect the medulla it is not a safe procedure. The danger, of course, lies in the risk of herniation of the bulb through the foramen magnum. In less severe cases, however, in which signs of bulbar compression are absent, careful drainage of spinal fluid by lumbar puncture is relatively safe and often leads to rapid relief of the general cerebral symptoms.

A third available method of dealing with raised intracranial pressure is by cerebral decompression. It has been strongly advocated by Cushing for apoplexy from hæmorrhage, thrombosis, or embolism, not only as a means of saving life, but also, in less serious cases, to restrict the amount of residual disability by diminishing local destruction of tissue from pressure due to œdema or blood-clot. Our knowledge of the results of this method is insufficient for judging whether or not it should be employed to the extent that Cushing advises. But it would seem to be clearly indicated when the blood pressure is rising and Cheyne-Stokes respiration is present; in other words, when the patient's life is *endangered from impairment of medullary function.*

Period of Rest in Bed.—The question as to how long a patient who has had a stroke should be kept in bed can be answered only in general terms and in regard to cases uncomplicated by bronchitis, heart failure, &c. In all severe cases the patient should be kept in bed for at least a month after consciousness has been recovered and other acute symptoms have passed off. Even when the stroke has been slight rest in bed for from 10 to 14 days is advisable.

Preventive Measures.

The physician's duties do not end when the patient has recovered from the acute effects of the vascular lesion. Apart from the treatment of residual disabilities, such as hemiplegia, he ought to review his patient's mode of living in order to ascertain whether anything can be done to avoid a recurrence. Thrombosis and hæmorrhage are probably always associated with arterial disease which cannot be eradicated. But it is often possible to diminish his liability to vascular accidents. Thus when syphilis is the essential cause adequate treatment ought to be persistently carried out. Patients with arterial hypertension should avoid excesses in food and alcohol as well as in mental and physical exertion. Worry is the common lot, but such patients should, as far as possible, avoid situations that are likely to be disturbing. Their diet should be light. Meat soups, strong coffee, and heavy meals should be avoided, and a regular morning saline is beneficial.

Lastly, although any reasonable abstinence ought to be insisted upon, it should be remembered that it is easy by excessive zeal for rules and regulations to foster a spirit of hopelessness in patients with vascular disease and to make their lives more miserable than need be. In consequence their activities should not be restricted within too narrow limits.

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Special Articles.

VISION AND TARGET SHOOTING.

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THE sport of rifle-shooting is by no means so popular in the British Isles as in the Overseas Dominions. There are several reasons that may be suggested, but no doubt the principal one is that Government encouragement is lacking. In the Dominions, Government support is hearty, and in consequence many more enthusiastic rifle shots are to be found. Still, there are many here who are constant visitors to Bisley, and the "King's" winner is a person of some small consideration. I therefore venture to make a few observations on the subject of sight in rifle-shooting and the special requirements for shooting spectacles.

The Essentials of Marksmanship.

Attainment of a high standard of marksmanship results from a combination of physical qualities, to which must be added certain mental characteristics as well. The public believe that good eyesight is the one great factor, but in this they are not quite accurate. Ability to see the object aimed at is certainly necessary, but not perfect vision. Fatigue of the eye, I think, and not bad definition, is the main cause of the difficulty in scoring well for a number of consecutive shots, as required in present-day competitions. I have had the opportunity of examining the eyes of many of the Bisley competitors, and it is upon these observations that this note is based.

Many of the younger men, although not emmetropic, do not feel the need of glasses so much, because fatigue is not so easily felt in youth where the application is not constant and intense. In Bisley shooting there is an interval for rest between each shot, possibly as much as two to three minutes when three competitors are firing at the same time.

Visual Defects in Shooters.

I have prescribed spectacles for 38 men who have been, or are, really good shots. Of these I find 22 were hypermetropic, 15 needing spheres only, and 7 cylinders with or without an additional sphere; 10 were myopic, and all but one of these needed cylinders as well as spheres: 6 showed mixed astigmatism. The greatest amount of manifest hypermetropia found was +1·50 sphere and of myopia −5·50 sphere. The strongest minus cylinder was −1·50 (no sphere). Among the hypermetropes I have no note of a cylinder exceeding +·75.

The Use of the Eyes in Shooting.

In shooting two points have to be observed and aligned—viz., the mark and the foresight. In old days one would have added a third, the backsight. Nowadays the aperture sight has made this an automatic part of the alignment, and incidentally has increased the ease and rapidity of aim and shooting to a very great extent. It has also aided those with defective vision by diminishing the cone of rays. The average size of aperture used is 0·05 in. to 0·08 in., or even in some cases 0·1 in.

The majority of shooting men at the moment of firing focus the tip of the foresight, which, in the short service rifle, is approximately 32 in. from the eye. Before the final pressure is applied the attention is concentrated on maintaining the relative position of the point of aim and the tip of the foresight. I say point of aim advisedly, for some men take what is known as "a six o'clock" aim—i.e., the tip of the foresight just below the mark, others aim at the top of the target, and others at the bottom. The eye, therefore, while aiming is alternately relaxing and accommodating, finally settling for a fraction of a second in partial accommodation. It can, then, be readily understood that errors of refraction tend to cause fatigue in older shots, particularly on sunny days or when many shots are fired consecutively. Add to this the strain of using a telescope to mark the "spotting disc" and to judge the wind by the mirage and we see the main value of the correction of faulty refraction is not so much to *see* the object aimed at well, but to put the eye under the best conditions for hard use.

Correction of Visual Defects in Shooters.

In prescribing glasses the point to which I wish to draw attention is that an ordinarily centred lens is not advisable, because in the position assumed when firing the eye looks through the upper and inner quadrant of the lens. (The match rifle-shot who usually assumes the supine position is not in question, only the service rifle user.)

In the prone position the body is carried well away to the left, so that the head is inclined to the left also in the act of looking at the mark. The face is inclined at a more or less acute angle to the ground, and the right eye is slightly further from the target than the left (in a right-handed man). This necessitates the line of vision passing, as has been pointed out, through some point situated in the upper and inner quadrant of the right lens, and, if no alteration of centre is mentioned in the prescription, a prismatic and curved image is produced. To counteract this it is necessary (*a*) to raise the frame; (*b*) to centre the glass so that the line of aim and the optical centre coincide; (*c*) to bring the face of the glass parallel in the vertical plane with the target.

Theoretically the shooting glass should be angled to correspond in the horizontal plane also, but in practice this is hardly needed. It will be found that an angle of 10°–15° back from the vertical is required to fulfil (*c*). An angling joint can be used for this.

The question of the lens employed for the left eye is also of some importance. As most men shut the left eye while aiming, it might be thought that a monocle would be most convenient (with due provision for the correct axis of any cylinder used). Most men use the left eye for telescopic purposes, as mentioned above, and for this a normal centring is sufficient in a toric lens. Seeing, however, that whether the normal distance between the pupils is preserved in the centring, or whether the eyes are supposed to be used independently, the optical centres and the pupils will not correspond when the subject is walking about, it is as well to warn him to wear the glasses only when in the shooting position. With a strong minus lens the decentring causes the lower edge to be very broad, and it is as well either to order a lens smaller than usual in diameter or to cut away the lower half. With some types of aperture sight the latter is, in any case, an advantage, as the recoil sometimes brings part of the sight in contact with the base of the frame.

The glasses for big-game and game-bird shooting need not, I think, be brought under the above rules. Shots with the sporting rifle are not always taken in the prone position, and in any other position the eye is not rotated so much away from the centre of the frame; while the shot-gun user needs certainly to see his mark, but his alignment of the gun upon it is dependent very slightly on aim. Instinctive muscular control directs the barrels just as in revolver snap shooting. The proper fitting of a shot-gun to the individual's anatomical construction is nine-tenths of the making of a good game shot. In the military rifle no more than a certain alteration in the length of the stock is possible.

Much remains to be learned of the physiology of rifle shooting, both with regard to vision and psychology. The causes of bad shooting are legion, and it is not always easy to assign the proximate cause. On the whole I am inclined to think that vision is by no means the chief factor in the equipment of the great shot, but is only one of many.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:

ANNUAL CONFERENCE.

(BY OUR OWN CORRESPONDENT.)

THE Tenth Annual Conference of this Association was held in London on July 3rd and 4th.

Visit to Burrow Hill Training Colony.

On the 3rd the delegates to the Conference proceeded to the Burrow Hill Training Colony, Frimley, Surrey, where, under the guidance of Sir Robert Philip, Dr. F. N. Kay Menzies, Dr. A. H. Macpherson, and the instructors at the colony, a tour of the grounds and buildings was made. The institution is delightfully situated, with ample ground for cultivation. There are separate blocks for sanatorium purposes, housing of the trainees, administration, and kitchen. It was stated that, up to December last, seven men out of nine discharged from the colony from the rural carpentry department had obtained employment, and 9 out of 31 from the gardens, a certain number being retained in the colony for its needs. To the inquiry made by one of the delegates as to whether or not 12 months' residence was sufficient for the necessary training, came the reply that this depended largely on the man's initiative. All produce grown is credited to the department concerned, and it was stated that the farm had become self-supporting in the space of two years.

There are two sections of the colony—the sanatorium and the training. These appear to be independent of each other, the financial responsibility for the maintenance of the patients in the former being borne by the county authority sending the patients, and in the latter as to three-fourths by the Ministry of Pensions, and as to one-fourth by the National Association for the Prevention of Tuberculosis. The entire cost of the patient per week is £2 6*s.* 10¾*d.* in the sanatorium and £2 12*s.* 6¾*d.* in the training section. The diet, judging from the details given, seemed adequate and varied. A point to which attention was drawn was that in the colony there was unfortunately no coöperation between the two sections, the nominees for each coming through different and independent authorities. The great difficulty in the work, to which also Sir Robert Philip drew attention, is the lack of any machinery for finding employment for the trainee on completion of his training, and in regard to this he pointed out that responsibility rests not alone on the colony, but must be shared by the authority which sends the patient. Success could only come by whole-hearted coöperation between the colony and care associations, and by the movement becoming a national one.

On Friday, the 4th, the Association met at 10.30 A.M. in the Robert Barnes Hall of the Royal Society of Medicine. Sir Arthur Stanley, chairman of the council, occupied the chair, introduced Mr. Wheatley, Minister of Health, and welcomed representatives from the Dominions, France, Holland, and the U.S.A.

The Need for Care Committees.

Mr. Wheatley said that the Conference was engaged in a work on which he himself had spent many years. The fight against tuberculosis was a winning fight, however prolonged. In 1847 there were 3189 deaths from tuberculosis per 1,000,000 living; in 1861, 2675; in 1881, 1923; in 1901, 1263; and in 1921, 854. There had been not only steady but even rapid progress, but still we had 70,000 fresh notifications of tuberculosis every year. The decline in the death-rate, he said, was closely related to improvement in social conditions, and the fall began seriously when food supplies cheapened, side by side with the improvement in general sanitary conditions which marked the latter part of the nineteenth century, and the rate of progress would be measured by the rapidity with which proverty was eliminated. Doubt, he said, had been thrown on the value of sanatorium treatment, but he thought it had proved its value in two ways—first of all, by educating the patient in the rules of health, and, again, by prolonging his life. The great problem, however, is to know what to do with the patient when he leaves the sanatorium. Only too often he had to return to the social conditions—the old hell—which he was unable to withstand when he contracted the disease, a most discouraging fact, after the expenditure of so much money and care, and one giving cause for grave concern to a Minister of Health. There was no hope of the patient being able to compete in the industrial market with the physically fit, especially in periods of great unemployment. So, just when he required additional means for additional sustenance, he was deprived even of an ordinary standard of living. Since 1919 the Ministry of Health had been impressed with the necessity of establishing care committees. Local authorities should at once organise and supervise care committees, and should establish a close, friendly, and confidential coöperation between them and the patients. The patient must be approached on terms, not of social, but of human equality. Part of their work would be to emphasise the value of good personal habits. There remained the much greater problem of how the patients were to earn the necessaries of life, for merely to maintain the patient was not good for him. In the effort to select some particular forms of work which these people could do economically, with a measure of State and voluntary help, certain experiments had been carried out—village settlements, for example—but caution was necessary in these matters. Hundreds of thousands of tuberculous people had to be provided for. Was it not possible to provide some scheme of workshops where the patient could work under favourable conditions and return to a decent home at night? The great difficulty was that of finance, and six months of experience had taught him that the Treasury remained quite independent of any political conditions.

Mr. Wheatley concluded by asking the delegates to furnish him with practical suggestions and schemes which could be made applicable to the whole country, and so help him to smooth the path of the sufferers.

Dr. F. N. Kay Menzies then read his paper on the

Part Played by Training Colonies in the Treatment of Tuberculosis,

abstracted on p. 99 of this issue of THE LANCET.

In the discussion which followed the reading of the paper, Dr. A. Sandison (Ministry of Pensions) defined the position of the Ministry, which was to carry out the obligations imposed by Parliament with reference to ex-Service men and endeavour to effect their physical restoration; also without attempting to duplicate existing organisations, to supplement the gaps in local schemes by making financial provision for the family while the patient is undergoing treatment, and, in coöperation with the Ministry of Labour, to subsidise schemes of training.

Dr. Lissant Cox (Lancashire) said that the fact that only 7 men out of 50 sent from his area, with a population of 1,750,000, to outside colonies completed their course of training was another nail in the coffin of these schemes. He thought it might be wise to merge these institutions in a sanatorium, having for its object purposeful work without the present ridiculous limitations in the time of residence. As to the village settlement, he considered Papworth, of which alone he had knowledge, a brilliant success.

Dr. Peyton (Cheshire) said the results of treatment were disappointing, while restoration to working capacity was a varying quantity which could not be guaranteed, and it was wrong to place on modern industry the incubus of tuberculous labour since, even without overhead charges, it was impossible to make consumptive labour self-supporting.

Dr. N. D. Bardswell (London) thought vocational training valuable, not so much as a means of subsequent livelihood as of rendering an otherwise tedious treatment of sufficient interest to persuade men to remain in an institution a long time. In his opinion an industrial settlement has a greater chance of success if guided by enthusiastic voluntary effort than if fettered by the restrictions which public ownership necessarily entails.

Dr. Hefting (Minister for Labour for Holland) said that they had just begun in that country, and looked to England, for example, where he had seen much that would be useful to his own country.

Mr. Allen (Leeds) thought that settlements were the best method of dealing with the problem, although the cost rendered them impracticable. Concurrent treatment and training had little practical value, because there are certain parts of farm work which the tuberculous cannot and ought not to do. Leeds had established successful coöperation between medicine and the business world.

Mr. Thompson (Hastings and St. Leonards) stated that in his area out of nine trained men four were satisfactorily employed either at Preston Hall or at Hastings Infirmary, whilst it has been impossible to find employers of labour to take the others on.

At the afternoon meeting of Friday the Organisation of Care Committees was considered, upon an excellent paper from Lieut.-Colonel J. A. Ellis, B.Sc.

DIETARIES IN MENTAL HOSPITALS.

REPORT OF BOARD OF CONTROL COMMITTEE.

ON March 26th, 1922, a committee was appointed by Sir Frederick Willis, chairman of the Board of Control, to consider the dietaries in county and borough mental hospitals, and to report what changes, if any, are desirable, and whether a minimum dietary scale should be fixed. Dr. R. W. Branthwaite was appointed chairman, and Mr. Harold J. Clarke secretary of the committee, the other members being Dr. L. O. Fuller, medical superintendent of the Three Counties Mental Hospital, Arlesey; Mr. W. J. Gibbs, steward of the Tooting Bec Mental Hospital; Dr. Major Greenwood, a medical officer of the Ministry of Health; Dr. P. T. Hughes, medical superintendent of the Barnsley Hall Mental Hospital, Bromsgrove; and Dr. R. Worth, medical superintendent of the Springfield Mental Hospital, Tooting. The report is divided into six main sections:—

(1) Details concerning existing mental hospital dietaries; (2) the dietetic needs of the insane; (3) the model dietary; (4) administrative improvements in kitchen control and equipment necessary to carry out the model dietary; (5) the cost of the adoption of the model dietary; (6) conclusions and recommendations.

Appendices include (*a*) an analysis of mental hospital dietaries; (*b*) anthropometric data concerning the insane (by Dr. Major Greenwood); (*c*) a report on the rate of basal metabolism in the insane (by Dr. C. Gerald Ainsworth); (*d*) specimen forms of tender for purchase of meat, fish, and cocoa; (*e*) specification and drawings of a plate-warmer in use at Winwick Mental Hospital (by Mr. W. H. Houghton, A.M.I.M.E.); (*f*) the model dietary; (*g*) report on some matters concerning kitchen equipment in Canadian and American mental hospitals (by Mr. S. J. Benham); (*h*) the estimated cost at each mental hospital of the model dietary as originally circulated, with analysis.

The first section on

Existing Mental Hospital Dietaries

is founded mainly on conditions existing in 1922. It is noted that some improvement has since been made in the feeding arrangements at a few institutions. This section is subdivided into the following chapters:—

(1) The physiological sufficiency of mental hospital dietaries; (2) accessory food factors (vitamins) and mental hospital dietaries; (3) existing methods for the supply, preparation, cooking, and distribution of food; (4) conclusions concerning existing dietaries.

In this last chapter the conclusions reached are summarised as follows:—

1. That there is an undesirable inequality in the construction of dietary scales throughout mental hospitals, some being well balanced and thoughtfully designed, whilst others impressed us as lacking in ingenuity.

2. That an unsatisfactory irregularity exists in the quantities of some staple articles of food supplied; a bare majority of diets being approximately correct in this particular—i.e., supplying an average quantity—whilst the remainder were either obviously deficient or possibly excessive.

3. That insufficient attention is paid to palatability and attractiveness, especially in the matter of the provision of a reasonable variety of dishes; breakfasts and teas providing the most common evidence of this defect.

4. That, although the details with which we were provided did not enable us to construct an absolutely reliable arithmetical estimate of the value of each diet scale (in terms of proteins, fats, carbohydrates, and calories), the result of analysis proved useful as confirmatory evidence, in cases where other indications suggested inadequacy or excess.

5. That it proved especially difficult for us to ignore the great difference that exists between dietaries showing the lowest and highest caloric values respectively; justifying a suspicion that the supply of food in the former is insufficient. This conclusion received support from the increased incidence of tuberculosis amongst males in the 12 institutions providing dietaries of the lowest arithmetical value.

6. That there seems to be some ground for suggesting that mental hospital dietaries may be deficient in certain accessory food factors (vitamins); probably deficient in fat-soluble A, and possibly also in water-soluble B.

7. That, when markets are available, some modification in the usual methods adopted for obtaining supplies is desirable, with a view to securing a greater variety of meat foods, with due regard to economy.

8. That every effort should be made to maintain a sufficient supply of high grade milk, the daily amount provided being inadequate in some mental hospitals and unduly restricted in others, and that, in order to secure good quality, especially in the matter of fat-content, routine analysis is essential.

9. That there are grounds for the suggestion that the complete substitution of margarine for butter has eliminated one of the most valuable sources for the supply of fat-soluble A, and that the partial reinstatement of butter is desirable.

10. That some institution dietaries would be improved by the more frequent and regular supply of fresh (especially green) vegetables, and fruit, and that, in order to carry this into effect, the close coördination that exists in many institutions between the farm management and the person responsible for kitchen supply should be universal.

11. That, although some mental hospital kitchens have been kept up-to-date, there are still many that are so inadequately equipped as to be incapable of anything more than the simplest routine cookery, whilst there are a large number that would be capable of still better work if provided with improved facilities.

12. That there is need for greater attention, in many institutions, to kitchen organisation, methods of transport, and ward equipment, in order that the supply of hot food to patients may be secured.

13. That there is reason to believe that smooth working, efficiency, and economy would result from the placing of all duties relating to the supply, preparation, and distribution of food, under the supervision of one individual, who should be responsible for their proper execution.

The Dietetic Needs of the Insane.

As to the dietetic needs of the insane, the committee conclude that the bases set out in the Report on the Food Requirements of Man, by the Food (War) Committee of the Royal Society,[1] are as applicable to patients in mental hospitals as they are to the general population, with certain modifications[2]; that the figures of body surface, used in that report for the computation of minimum energy requirements, should be adopted as applying with equal force to the insane population; that it is necessary to allow for patients in mental hospitals, as did the Royal Society's

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[1] Harrison and Sons, March, 1919.

[2] The only modifications considered necessary are the substitution of 11 for 8 hours' sleep and the estimation of an average "work" allowance of 400 calories net energy for both sexes, or about one-third more than the Royal Society's Committee estimated for a tailor. The chief consideration that led to the adoption of the latter modification was the fact that, although only a comparatively small proportion do really hard work on farms or in gardens, kitchens, laundries, &c., others not so employed are expending energy for a fair part of each day in ward work, if only "pottering about," in restless or aimless movement in wards or airing courts, or in muscular exercise accompanying even moderate excitement or mental irritability. All such patients expend more energy during the course of a day than does a tailor at his occupation.

Committee for the general population, a 10 per cent. increase to represent the difference between food as purchased and food digested, and a further addition applicable even in the most sedentary occupations of 300 calories per diem for "locomotion"; that upon the grounds detailed in the foregoing paragraphs the net energy requirements of male and female patients in mental hospitals, in terms of calorie values, may be calculated at approximately 2800 for males and 2500 for females. These figures should be regarded as standard minimum figures applicable to the ordinary population of mental hospitals, and there should be an addition of suitable energy values in the case of individual patients who are really actively employed.

The Model Dietary.

It was obvious that any attempt to impose a hard-and-fast standard dietary, for use in all mental hospitals, would be doomed to failure. Patients vary in type in different institutions, which, again, are conducted under widely different conditions. Moreover, it was considered important that nothing should be done to tie the hands of managing authorities to such an extent as to cripple enterprise or interfere with the exercise of ingenuity. It is emphasised in the report that the scale suggested for winter months is not to be regarded in any sense as a fixed dietary for universal use, but merely to serve as a model for the guidance of visiting committees, to show what are regarded as the food requirements for ordinary patients in a mental hospital, and to demonstrate the possibility of providing a dietary, in which a reasonable variety is maintained, at a moderate cost.

A Model Dietary (Abridged) for Adult Patients During Winter Months.

Breakfast (daily).—Males, 6 oz. bread; females, 5 oz. bread; tea, coffee, or cocoa, 1 pint; margarine or butter, ½ oz. With one or other of the following extras: Galantine of beef, brawn (beef or pork), veal loaf, breakfast sausage, corned beef, bacon, rissoles, black puddings, fish cakes, kedjeree, kipper, bloater, haddock, egg, marmalade, jam, cheese, macaroni cheese, or porridge. The allowance for each patient, on alternate days with ½ pint porridge, is 2 oz. of any of the above-mentioned prepared meats, 4 oz. dried fish, or 1 oz. cheese or jam. Butter should be mixed with margarine in the proportion of 25 per cent. of the former to 75 per cent. of the latter, or be given (½ oz.) in place of margarine at seven breakfasts or teas (at least) during each two weeks. From April to September stewed fruit, marmalade, jam, &c., may replace porridge. In no case should breakfast consist of a beverage and bread and margarine (or butter) only.

Dinners (October–March).—The allowances are as follows:—

	Males.	Females.
Meat, uncooked, and including bone	6 oz.	5 oz.
Bacon, boiled, ditto	3 ,,	2½,,
Fish (including bone-cleaned, ready for cooking)	8 ,,	7 ,,
Rabbit or meat pie or pudding	20 ,,	17 ,,
Soups	1 pint	1 pint
Stews	1 ,,	1 ,,
Potatoes (unpeeled and uncooked)—		
Only with fish	9 oz.	7 oz.
In addition to fresh vegetables with roast or boiled meat dinner	7 ,,	6 ,,
With stew	8 ,,	8 ,,
Fresh vegetables—i.e., greens, carrots, parsnips, turnips, onions, &c.	6 ,,	6 ,,
Bread	2 ,,	2 ,,
Puddings (flour), such as jam, treacle, raisin, currant, date, fig, ginger, bread, &c.	8 ,,	8 ,,
Puddings (milk)—rice, sago, tapioca, semolina	½ pint	½ pint
Bread and cheese—		
Bread	2 oz.	2 oz.
Cheese	1½,,	1½,,

Alternative dinner dishes are hot pot, cottage pie, shepherd's pie, sea pie, liver and bacon, pork and beans, sausages, curried meat or rabbit, haricot ox tails, tripe and onions, &c. An apple, orange, or banana should be given for dessert (or at tea) at least twice a week throughout the winter months.

During the summer some of the hot dinners should be replaced by cold, accompanied by salads, lettuces, radishes, tomatoes, &c., and fresh fruit puddings or stewed fruit substituted for some of the heavier suet puddings; fresh uncooked fruit should be regularly supplied when obtainable at reasonable cost.

Tea (October–March) (daily).—Males, 5 oz. bread; females, 3 oz. bread; cake, 3 oz.; margarine or butter, ½ oz.; tea, cocoa, or coffee, 1 pint. With one or other of the following extras: Jam or marmalade, seven times per fortnight, 1 oz. each patient; meat or fish paste, bloater, or shrimp and salmon, &c., seven times per fortnight, ½ oz. each patient.

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The total issues of this week's dietary in pounds per week for 100 male patients and for 100 female patients are set out below:—

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	lb.	lb.		lb.	lb.
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Mutton	$37\frac{1}{2}$	$31\frac{1}{4}$	Rice, tapioca, sago, semolina.	$6\frac{1}{4}$	$6\frac{1}{4}$
Rabbits	$37\frac{1}{2}$	$31\frac{7}{8}$	Baking powder	$\frac{15}{16}$	$\frac{15}{16}$
Fish (hake)	50	$43\frac{3}{4}$	Golden syrup and jam	$12\frac{1}{2}$	$12\frac{1}{2}$
Potatoes	$293\frac{3}{4}$	$253\frac{3}{4}$	Sugar	$6\frac{1}{4}$	$6\frac{1}{4}$
Greens	$112\frac{1}{2}$*	150*	Raisins	$6\frac{1}{4}$	$6\frac{1}{4}$
Other vegetables	$121\frac{14}{16}$	$81\frac{5}{8}$	Bread	$110\frac{15}{16}$	$110\frac{15}{16}$
Suet	33	$31\frac{1}{8}$	Milk	50 pints.	50 pints.
Flour	$98\frac{1}{16}$	$90\frac{9}{16}$			
Barley	$3\frac{1}{8}$	$3\frac{1}{8}$			
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Details of ingredients for all the dishes suggested are appended, even to the amount of tea, sugar, and milk to be used for 100 pints.

The extreme variation in the expenditure of energy by patients rendered the construction of a model dietary, scientifically adjusted to suit the requirements of all patients in mental hospitals, an impossible task. The committee decided to regard all inmates of mental hospitals as falling within one or other of two categories: (*a*) the physically fit, or approximately fit, whether workers or non-workers, and (*b*) the infirm and sick. On this basis the model dietary should apply to nearly 75 per cent. of all patients in mental hospitals. In some of the dietary scales in current use supplied to the committee the evidence seemed to point to the diet of non-workers being barely sufficient, whilst that for workers had in general the appearance of being generous; a condition doubtless designed to encourage work, for therapeutic and economic reasons. Whilst the committee are in full agreement with the exercise of all reasonable efforts to induce patients to occupy themselves for their own advantage and that of the community, they are not satisfied that reliance upon additional food to produce this result is altogether justifiable. Many of the unemployed are physically unfit for regular work and need a good dietary for therapeutic reasons, and many are non-workers because of mental disease, although physically fit. They think that if the full dietary is extended to non-workers also, so far as it reasonably can be, the incidence of diseases such as tuberculosis and dysentery will be proportionately diminished. The establishment of a token system and the provision of facilities for the purchase of luxuries may be used to provide the necessary stimulus to effort among those who can work.

A Minimum Dietary.

The committee are of opinion that no dietary for ordinary patients in any mental hospital (including both workers and non-workers, and excluding the infirm and sick) should be allowed to fall below the nutritive and calorie values of the model, and that no dietary should be less varied in character than is indicated in their model scales. The dietetic requirements of the infirm and sick are matters that must be left to the discretion of the medical staff, and the substituted dietaries proposed for the infirm are therefore merely tentative suggestions.

The fourth section of the report is devoted to the administrative improvements necessary to carry out the model dietary, the chief of which appears to be the delegation of responsibility for the supply, cooking, and distribution, and service of food to one person. The committee advocate, in order to secure a better food supply and greater economy, a general improvement in the status of stewards, and the gradual conversion of the holder of this post from one who is now little more than a machine into an administrator with responsibility, and proportionately increased remuneration. They do not suggest, however, the wholesale transformation of existing stewards into food controllers because they happen now to be stewards, or any general disturbance of existing conditions in order to bring such a scheme into force immediately. The development must of necessity be a gradual one. As to the kitchen, this should be controlled, under the guidance of the person who is responsible for general direction, by one who is willing to abandon old routine methods, adopt new ones, and show readiness to exercise ingenuity in the production of a dietary at the lowest cost compatible with a good and varied scale. Great care should be exercised in the choice of the head of the kitchen staff; the committee recommend the abolition of the designation "cook" as denoting more a domestic servant than a responsible officer, with the substitution therefore of "kitchen superintendent" or "kitchen supervisor." Such a scheme would, no doubt, necessitate a higher rate of remuneration, but this is indicated in any case in many hospitals, and should be made dependent upon efficient administration. As to kitchen equipment, a list is given of items of equipment of proved value only, all of which are useful adjuncts from an economic standpoint.

Cost of the Adoption of the Model Dietary.

Unfortunately a comparison between present expenditure on food in mental hospitals and the cost of the adoption of the model scale was not easy to make, as so many mental hospital authorities are unable to produce details concerning food supplied to their patients as distinct from that provided for staff. The committee strongly urge the desirability of separate accounting in future, as is done in establishments under the control of the Metropolitan Asylums Board. In the absence of separate data it is difficult to decide whether an institution is conducted with due regard to economy or not, and, if not, where the fault is to be found. When food expenditure for staff and patients is grouped under one heading, the total cost of the two may not call for comment; whereas, if dissected, it may be found that the outlay on patients' account is unreasonably low, and that for staff unnecessarily high. In order to obtain some definite data on which to base an estimate of the cost of the suggested model dietary, copies were circulated to medical superintendents of 95 mental hospitals, accompanied by a schedule containing the exact quantities of all articles for an average week for 100 patients, 50 of each sex. The discrepancy between the replies received is astonishing. In one mental hospital (Plymouth) the total cost of the provisions is £33 17*s*. 10*d*., with a range of values at other places down to the lowest (Lancaster) £18 2*s*. 2*d*. Extremes of estimated cost are conspicuous under every item of expenditure—due, in part, to lack of uniformity in methods of purchase, to variety in character of material obtained, or to the accessibility or inaccessibility of markets, but in the main, it is thought, to the absence of any proper principle governing the charging up of home produce at regulated prices.

In commenting on the variations in the returns as to meat, potatoes, and vegetables, it is pointed out that the prices charged for articles supplied from home farms should represent current local market figures. It is probable that in many instances prices are unduly inflated in order to show a profit on farm management. For example, the main supply of milk is obtained from hospital farms, but the price at which it is invoiced to institutions varies from 9*d*. to 2*s*. 6*d*. per gallon, a difference in cost that can hardly be justified. The cost of the model dietary according to the average of the estimates from 95 institutions would work out at 8·2*d*. per head per day, and should not in the considered opinion of the committee exceed 8·5*d*. in county and 8·75*d*. in borough institutions. Whether or no these figures exceed existing expenditure on food in the majority of hospitals, the committee are of opinion that no local authority can consider the amounts as other than economically justifiable.

The report ends with the following

Conclusions and Recommendations.

1. That there should be more uniformity in the construction of mental hospital dietary scales, especially in regard to (*a*) the character of food given; (*b*) its total amount; (*c*) the amounts of certain staple articles of diet; and (*d*) the avoidance of monotony.

2. That the average calorie values of dietaries for ordinary patients in mental hospitals (including workers, and excluding those on substituted diets) should not fall below 3220 for males, and 2875 for females.

3. That to ensure the presence in dietaries of necessary accessory food factors (vitamins) there should be a partial reinstatement of butter as a regular article of diet, a supply of milk in greater quantity, an increased provision of green and other fresh vegetables, a more common use of eggs, a free administration of salads and fresh fruit, and a more general use of wholemeal or germ bread.

4. That, as these improvements would be secured by the adoption of our suggested model dietary, and as, under proper conditions, the cost of this dietary at present prices should not exceed 8½*d*. per head per day for county mental hospitals, and 8¾*d*. for borough institutions, we commend its general adoption in public mental hospitals, with such modifications as may be necessary to meet varying local conditions.

5. On grounds of economy as well as efficiency it is important: (*a*) To establish a unified food department in each institution, under a competent and responsible head, for dealing with the supply, cooking, distribution, and service of food; (*b*) to provide each institution with adequate kitchen equipment; (*c*) to endeavour to secure, as kitchen workers, the services of persons more highly skilled in cookery by making these posts more remunerative and attractive. This refers more particularly to the responsible head; and (*d*) to pay greater attention in many hospitals to other points dealt with in the body of this report relating to the cooking, distribution, and service of food.

6. That substantial economies can be secured by paying greater attention to the terms of specifications and contracts, and by taking more advantage of wholesale markets.

7. That, in regard to food expenditure, separate accounting, as between patients and staff, should be the rule in all mental hospitals.

8. That it would be a great advantage if an officer skilled in these details could be appointed on the Board of Control staff temporarily, to advise and assist local authorities in regard to the adoption of the model dietary.

The committee desire to acknowledge the marked ability with which Mr. Harold J. Clarke has discharged his duties as secretary.

Committee for the general population, a 10 per cent. increase to represent the difference between food as purchased and food digested, and a further addition applicable even in the most sedentary occupations of 300 calories per diem for "locomotion"; that upon the grounds detailed in the foregoing paragraphs the net energy requirements of male and female patients in mental hospitals, in terms of calorie values, may be calculated at approximately 2800 for males and 2500 for females. These figures should be regarded as standard minimum figures applicable to the ordinary population of mental hospitals, and there should be an addition of suitable energy values in the case of individual patients who are really actively employed.

The Model Dietary.

It was obvious that any attempt to impose a hard-and-fast standard dietary, for use in all mental hospitals, would be doomed to failure. Patients vary in type in different institutions, which, again, are conducted under widely different conditions. Moreover, it was considered important that nothing should be done to tie the hands of managing authorities to such an extent as to cripple enterprise or interfere with the exercise of ingenuity. It is emphasised in the report that the scale suggested for winter months is not to be regarded in any sense as a fixed dietary for universal use, but merely to serve as a model for the guidance of visiting committees, to show what are regarded as the food requirements for ordinary patients in a mental hospital, and to demonstrate the possibility of providing a dietary, in which a reasonable variety is maintained, at a moderate cost.

A Model Dietary (Abridged) for Adult Patients During Winter Months.

Breakfast (daily).—Males, 6 oz. bread; females, 5 oz. bread; tea, coffee, or cocoa, 1 pint; margarine or butter, ½ oz. With one or other of the following extras: Galantine of beef, brawn (beef or pork), veal loaf, breakfast sausage, corned beef, bacon, rissoles, black puddings, fish cakes, kedjeree, kipper, bloater, haddock, egg, marmalade, jam, cheese, macaroni cheese, or porridge. The allowance for each patient, on alternate days with ½ pint porridge, is 2 oz. of any of the above-mentioned prepared meats, 4 oz. dried fish, or 1 oz. cheese or jam. Butter should be mixed with margarine in the proportion of 25 per cent. of the former to 75 per cent. of the latter, or be given (½ oz.) in place of margarine at seven breakfasts or teas (at least) during each two weeks. *From April to September* stewed fruit, marmalade, jam, &c., may replace porridge. In no case should breakfast consist of a beverage and bread and margarine (or butter) only.

Dinners (October–March).—The allowances are as follows:—

	Males.		Females.
Meat, uncooked, and including bone ..	6 oz.	..	5 oz.
Bacon, boiled, ditto	3 ,,	..	2½,,
Fish (including bone-cleaned, ready for cooking)	8 ,,	..	7 ,,
Rabbit or meat pie or pudding	20 ,,	..	17 ,,
Soups	1 pint	..	1 pint
Stews	1 ,,	..	1 ,,
Potatoes (unpeeled and uncooked)—			
Only with fish	9 oz.	..	7 oz.
In addition to fresh vegetables with roast or boiled meat dinner	7 ,,	..	6 ,,
With stew	8 ,,	..	8 ,,
Fresh vegetables—i.e., greens, carrots, parsnips, turnips, onions, &c.	6 ,,	..	6 ,,
Bread	2 ,,	..	2 ,,
Puddings (flour), such as jam, treacle, raisin, currant, date, fig, ginger, bread, &c.	8 ,,	..	8 ,,
Puddings (milk)—rice, sago, tapioca, semolina	½ pint	..	½ pint
Bread and cheese—			
Bread	2 oz.	..	2 oz.
Cheese	1½,,	..	1½,,

Alternative dinner dishes are hot pot, cottage pie, shepherd's pie, sea pie, liver and bacon, pork and beans, sausages, curried meat or rabbit, haricot ox tails, tripe and onions, &c. An apple, orange, or banana should be given for dessert (or at tea) at least twice a week throughout the winter months.

During the summer some of the hot dinners should be replaced by cold, accompanied by salads, lettuces, radishes, tomatoes, &c., and fresh fruit puddings or stewed fruit substituted for some of the heavier suet puddings; fresh uncooked fruit should be regularly supplied when obtainable at reasonable cost.

Tea (October–March) (daily).—Males, 5 oz. bread; females, 3 oz. bread; cake, 3 oz.; margarine or butter, ½ oz.; tea, cocoa, or coffee, 1 pint. With one or other of the following extras: Jam or marmalade, seven times per fortnight, 1 oz. each patient; meat or fish paste, bloater, or shrimp and salmon, &c., seven times per fortnight, ½ oz. each patient.

The supply of cake should be varied, being made either with currants, sultanas, raisins, or carraway seeds. Scones, buns, or oatmeal biscuits of the same weight may be issued in lieu. During summer months the jam or pastes should be replaced by fresh vegetables or fruit. Lettuces, onions, tomatoes, radishes, watercress, mustard and cress, or beetroot are desirable foods, for the regular provision of which arrangements should be made.

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Suet.. ..	33	$31^{1}/_{8}$	*Milk* ..	*50 pints.*	*50 pints.*
Flour ..	$98^{1}/_{16}$	$90^{9}/_{16}$			
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CONFERENCE ON INFANT WELFARE.

THE Third English-speaking Conference on Infant Welfare was opened by Mr. Wheatley, the Minister of Health, at Caxton Hall, Westminster, on July 1st, Dr. G. F. Still presiding. There were about 700 delegates present from 30 different countries.

Mr. Wheatley said that their object was not to relieve mothers, but to train and help them. No governing body could replace the mother. Maternal mortality from childbirth had not declined, and his department was giving great attention to this preventable mortality and the morbidity which was inevitably associated with it. A circular would shortly be issued to local authorities reminding them of their powers. The first essential was care of the expectant mother. By medical inspection in the schools the future mothers would be physically better; by the teaching of mothercraft they would be better equipped mentally. Three things were necessary: antenatal medical supervision, a more highly skilled obstetric service, and homes safe for confinements. Until better homes were obtained more lying-in hospitals and homes were needed. The number of lying-in homes aided by the Ministry was 135 and he hoped many more beds would soon be available. These lying-in homes had a great educational value. Infant mortality had been halved since 1900, and he believed the reduction was largely due to those engaged in child welfare work. There were still black spots in industrial districts and they must bring opportunity to those in need and not rest content until the worst wards of a town were as good as the best. In introducing a system for the care of expectant mothers they had to combat prejudice and conservatism. They needed a greater army of helpers and, if they were to succeed, the help given must not be tainted by charity or patronage. The workers engaged must get down to the same human, if not the same social level, as those to be helped. Health visitors needed a very thorough training. It was slower work training a health visitor than training a "dilutee" for building houses. The period of false economy was over. We could afford to spend more in the preservation of our young. The present Government was prepared to make grants in aid of any well-considered scheme submitted by a local authority.

Training of Midwives, Health Visitors, and Nursery School Workers.

Colonel R. J. Blackham described the appalling conditions under which childbirth takes place in India, partly owing to the religious prejudice that the lying-in woman is ceremonially unclean, partly to the belief that fresh air is dangerous to mother and child, and, lastly, owing to the ignorance and superstition of an hereditary caste to whom for centuries custom has consigned the care of all parturient women. Colonel Blackham gave a graphic description of how confinements are usually conducted by these "handy-women" known as *dais*. He went on to show how, at the instance of Queen Victoria, Lady Dufferin, the wife of the then Viceroy, started a fund to provide women doctors in 1885 and how this work has since spread. He described briefly the work which was being done by properly trained midwives in Calcutta, Delhi, Madras, and Bombay, showing that a definite movement is now in progress to combat the social and semi-religious customs which are responsible for the terrible dangers which have hitherto attended childbirth in India.—Dr. A. Souza (India) mentioned that the infant mortality in India was still about 600 per 1000 births.

Dr. Ethel Cassie (chief medical officer for child welfare, Birmingham) followed with a practical paper on the training of midwives and pointed out many of the weak spots and difficulties. The midwife was usually engaged about the seventh month and very little was done in the matter of antenatal inquiries. There were too many vaginal examinations and few midwives practised abdominal palpation. The visits during the puerperium were not sufficiently frequent to prevent delay in summoning a doctor for a rise of temperature. Midwives attended too many cases to do their patients justice. Medical practitioners when called in did not arrange to visit when the midwife was present, and therefore could not instruct her directly. The teaching of infant care to pupil midwives in maternity hospitals lags behind modern standards. The larger training schools have antenatal clinics, but this is not yet general. Independent midwives who are recognised teachers of midwifery cannot give instruction in antenatal work. The pupil midwife must have such instruction from a medical expert. Pupil midwives, during their training, should be enabled to see something of puerperal sepsis and should have practical instruction in the use of silver salts as a prophylactic against ophthalmia neonatorum, and should also be taught how to bathe an inflamed eye. They also needed to learn more with regard to venereal diseases. Above all the training of the pupil midwife failed with regard to the management of the mother's breasts and lactation. The nursery of every training school should be under the direction of a child specialist. All these suggestions implied a longer and more expensive training and if, in addition, the midwife were to take fewer cases her financial position must be by some means improved.

A paper on the training of the health worker by Dr. Janet Lane-Claypon brought up the vexed question as to whether the full training of a hospital nurse was a desirable or necessary preliminary to the career of a health visitor. In the subsequent discussion it appeared that most local authorities expect a health visitor to have the triple qualification of a fully-trained nurse, a certified midwife, and to be the holder of a recognised certificate in child welfare. It was agreed on all hands that whatever the training the personality of the health visitor was of supreme importance.

Miss E. Stevenson (principal of the Rachel Macmillan Nursery School, Deptford) read an interesting paper on these pioneer institutions. These schools need superintendents with a many-sided experience and a considerable power of initiative. The staff comprises, first, the heads of the shelters, whose work is being determined by the experiments now in progress, the Froebel Higher Certificate being one of the qualifications accepted; secondly, the student apprentices who work in the shelters; and thirdly, there is room for a large number of voluntary workers who will profit much by a training of, say, one year in the management of little children.

The afternoon session was devoted to the question of the

Unmarried Mother and Her Child.

Mr. Neville Chamberlain presided at the opening, and was succeeded in the chair by Mrs. H. A. L. Fisher. Mr. Chamberlain pointed out that there were more births in France than in England in 1923, and that there were 73,000 infant deaths in France to 52,000 in England, the infant mortality in France having been 96 while that in England was 69. Infant mortality in England among illegitimate children was, however, more than double that among the legitimate, and the damage-rate was certainly correspondingly excessive.

Dr. Letitia Fairfield, barrister-at-law, in an informative paper, dealt with the legislation of various countries at different times affecting illegitimacy. England was exceptional in the rule of "once illegitimate always illegitimate."

Miss J. E. Higson (Liverpool) spoke on the great need for residential accommodation for the unmarried mother and her child. She expressed her approval of the inspection, at present carried out by the Ministry, of homes for the unmarried mother and her child. One of the great needs was more accommodation in such homes, so that the expectant mother could be admitted during the antenatal period both for physical and psychological reasons. The staff of these homes was often inadequate to meet the strain of the work. Smaller homes, although more costly, were much better. Care should be given to secure that the furnishings were bright and attractive and the dresses worn becoming. The Liverpool guardians were exceptional in having appointed a staff of welfare workers to care for these mothers. Miss Higson pleaded for more sympathetic treatment of the woman who had her second illegitimate baby.

Dr. Julius Levy (U.S.A.), in a paper entitled the Prevention of Foundlings, described the system in vogue in New Jersey. A supervisor of unmarried mother work is appointed, who visits the hospital where the mother is confined, and works out a plan whereby the baby can be kept with, and nursed by, its mother. In about two-thirds of the cases relatives are persuaded to take the mother and her baby. During the last four years 90 per cent. of the babies have remained with their mothers for three months and 76 per cent. for six months. It is claimed that since the scheme was started the infant mortality-rate among the illegitimate babies has been about the same as that prevailing among legitimate.

The keynote of the discussion was that every effort must be made to keep mother and child together. There is, of course, general agreement that this arrangement should hold until the baby is weaned, but the speakers did not throw much light on the problem of how to find a permanent home for the illegitimate child with its own mother.

The discussion on

Child Adoption

on the second day was the complement to the discussion on illegitimacy. Mrs. D. Margesson (London) (hon. secretary of the National Adoption Society), Mr. G. B. Hurst, K.C. (London), and Dr. H. D. Chapin (president of the Children's Welfare Federation, New York), made out an unanswerable case for legalised adoption. England is one of the few civilised countries in which adoption is not yet legalised. If adoption were legalised a large number of homes would be available for the maintenance of derelict children. As Dr Chapin puts it, "Homeless children should be put in the childless homes to the lasting benefit of both." And again, "To be brought up in a precarious manner by the hard uncertain struggles of an unmarried mother without normal home-life and with the stigma of illegitimacy hanging over its head is not a happy outlook" Or to quote Mrs. Margesson: "It is a fact that there is no natural place, economically or socially, for an unmarried mother and her child to live together in a civilised country." There is no need for the National Council for the Unmarried Mother and her Child and the National Adoption Society to remain in opposite camps. There is room for both. There are no doubt a considerable number of cases where the unmarried mother and her illegitimate child can make a good home with relatives. Failing that, surely the legal adoption of the child into a good family is the best solution of the problem.

Lady Nott-Bower mentioned that adopters would not be forthcoming for the child of a mentally defective mother, but surely *no* child should be left to the care of a feeble-minded mother. The remedy for this last problem is obviously the better supervision of mentally defectives.

Another part of the morning session was devoted to discussing the

Overseas Settlement of Children.

Sir Arthur Lawley gave an interesting account of the farm school established in Western Australia by Kingsley Fairbridge, a Rhodes scholar, who took out 25 boys. The scholars now number 200, 100 girls and 100 boys. The school has been wonderfully successful.—Mr. Percy Roberts described the large-scale operations of Dr. Barnardo's homes in sending boys to the colonies and the wonderful success obtained.—Dr. Mildred Thynne (maternity and child welfare medical officer, Bermondsey) described the obsolete Board of Trade regulations with regard to the diet of children on ocean steamers. Fortunately the shipping companies are not content with the Board of Trade's minimum, but Dr. Thynne made out a case for greater attention to this important matter.—Dr. E. W. Morris (the representative of the Australian Commonwealth) described the careful measures which were taken to safeguard the health of children during the voyage to Australia. He further said that among the emigrated children there were no failures. Failures occurred among adult and middle-aged persons owing to faulty selection.

Day Nurseries.

In the afternoon session the Hon. Mrs. Eustace Hills, who presided, dealt with the educational value of day nurseries to the parents who utilised them.—Sir Bruce Bruce-Porter read a paper on the Preventive Side of Day-Nursery Work and Dr. Crichton Miller one on the Psychological Benefit to children of being in a Day Nursery.

The morning session of July 3rd was devoted to the consideration of the

Available Measures for Securing Healthy Pregnancy and Safe Delivery.

The principles on which the new system of preventive midwifery should be founded, as contrasted with the emergency midwifery which has hitherto been the rule, were ably expounded by Lady Barrett. The move which is being made in the same direction in the U.S.A. and the Dominion of Canada was dealt with by Miss C. van Blarcom (New York) and Dr. Helen Macmurchy (Canada).—Dr. E. W. Morris, who presided, uttered a word of caution from the experience of Australia as to the need for safeguarding the proper expenditure of the maternity benefit.—Dr. Amand Routh described the growth of antenatal work in London during the last ten years. Representatives from New Zealand, British Columbia, Singapore, the Leeward Islands, and India described the development of this work in their respective countries.

Among the many important points made by Lady Barrett were the following: We must get rid of the prevalent idea that it is the lot of women to endure. Every lying-in home should be affiliated to a fully-equipped woman's hospital. There should be special sessions at the larger maternity centres for venereal diseases. Gonorrhœa is quite an important cause of puerperal sepsis. Better training of doctors and midwives, especially in the early symptoms which lead to morbidity and mortality, is urgently needed. The causes of abortion have been insufficiently studied, and hospital beds are required for cases of threatened abortion. The education of all sections of the public is necessary in order that the money may be forthcoming for combating the present deplorably high maternal and neonatal mortality.

Propaganda and Visits.

The last session, held under the auspices of the National Baby Week Council, discussed the most effective methods of propagandism on maternity and child welfare. In addition to the ordinary sessions many lectures and visits to institutions engaged in maternity and child welfare work were arranged for the delegates. Special meetings were arranged for Poor-law guardians and by the Eugenics Education Society. The Association of Infant Welfare Centres discussed 'Toddlers' Playgrounds and the reorganisation of health visiting schemes at a special meeting. The annual meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health was held on July 3rd, and all medical representatives attending the Conference were invited to be present. Prof. E. Mellanby opened a discussion on the treatment of babies suffering from malnutrition, and indicated the results obtained by him at the Sheffield Infirmary by the employment of a carefully adjusted vitamin-rich diet.

VIENNA.

(From our own Correspondent.)

Effect of X Rays Upon the Pregnant Myomatous Uterus.

At one of the recent meetings of the Vienna Medical Society Dr. Schilles demonstrated the case of a woman, 43 years of age, who had repeatedly applied for help in order to be relieved from her sterility, which was due to myomatosis. In 1906 and 1912 she had had spontaneous abortion, and in 1918 again severe hæmorrhage had set in. The diagnosis of extensive myomatosis had induced her surgeon to advise excision of the uterus but she refused, and a series of sittings under X rays was instituted in 1920 and 1921, with only partial castration resulting. Patient had hæmorrhages occasionally, and next year she became pregnant. When admitted to the gynæcological clinic in her ninth month, eclamptic attacks supervened and she had to be delivered rapidly, a high forceps extraction being performed. The baby was born in an asphyxiated condition but could be revived. The puerperium was normal for one week, but on the seventh day high fever set in, and a diagnosis of necrosis of myomatous nodules was made. A supravaginal amputation was made and the patient left the hospital later in perfect health. In the specimen a large number of small and large nodules was found. These had no doubt previously hindered impregnation or the development of the fertilised ovum, as has been shown to be the case in similar instances by Olshausen and Lawdan. The application of X rays had, however, produced such a shrinkage of the obstructing myomatous growths that the mucous membrane had regained its capacity to retain the ovum. It is well known that metrorrhagic conditions can be influenced by careful dosage of X rays. The sterility which follows as a rule upon well applied full doses of X rays may be only temporary; one case is known in which after an interval of 14 years, in one of the first cases treated that way, conception took place. Other instances in which women have been rendered capable of bearing a child to full term by means of X rays have already been reported by Steiger, Zangemeister, and Schuhmann.

An Anti-Smoking Campaign.

An appeal to all medical practitioners has just been published, in which their coöperation is demanded in the effort to suppress, or at least cut down, the habit of smoking. In a leaflet, sent to every individual doctor, it is pointed out that over 80 per cent. of all the nicotine contained in the tobacco flakes or leaves goes over into the smoke. According to the pharmacologist Kobert, the poisonous effect of nicotine is equal to that of prussic acid, and affects all the systems of the body—the cardiovascular, alimentary, respiratory, and nervous. In the opinion of Erb (Heidelberg) it is one of the chief ætiologic factors in producing early arterio-sclerosis, and all smokers show earlier or later distinct disturbances of the innervation of the vascular system. Spasmodic conditions, like angina pectoris, dysbasia angiosclerotica (Erb), temporary unconsciousness, neuralgia, vertigo of all types are frequent at the age of 40–50 years in inveterate smokers, also early sudden death due to heart failure. Frankl Hochwart (Vienna) has illustrated the serious dangers to the nervous system in a series of 1500 case-histories obtained from well-to-do private patients, and the pathological changes in sight and hearing, besides the predisposition to cancer of lips and tongue in obstinate smokers, are well known to all doctors. Other students in France, in America, and in Sweden have come to the same conclusion that nicotine is one of the most potent factors in the increasing morbidity of civilised life. The leaflet urges the profession to discourage the custom of smoking in bedrooms and sitting-rooms or in public localities where numerous non-smokers also assemble. Especially where children are concerned, smoking should be strictly prohibited, and adolescents should under no conditions be permitted to indulge in the habit since it tends to promote weakness of the will, apart from harmful effects upon physical development. In subjects prone to catarrhal conditions the inhalation of smoke-laden air is apt to cause further deterioration of the delicate respiratory organs. A characteristic of the modern trend of feminine independence is the unrestrained smoking by girls and women. Their nervous system is easily brought into disorder by an excess of smoking, and there is a group of physicians who attribute female sterility to abuse of tobacco. From an economic point of view, the leaflet says, it is well worth knowing that the daily expense of the Austrian population for tobacco exceeds the annual deficit of all our tuberculosis sanatoriums, some of which had to be closed down for want of funds. The costs of two new tobacco factories erected by the State were not much below that sum. The sums saved yearly by a non-smoking community of 6½ millions would be sufficient to pay the entire Government debts in two and a half years and defray the costs of over 40 per cent. of the annual budget in addition. The appeal to the profession does not intend to inform the doctor of the detrimental effects of smoking, but to induce him to collaborate in the prophylaxis against the evil. Medical men are exhorted to unite in bringing about legislation against juvenile smokers, and to set an example in abstaining from smoking themselves. The leaflet is also intended to be laid out in the waiting-rooms of the doctors, and the signatures of 30 leading professors of medicine appended would seem to indicate that the appeal is not merely faddist propaganda. The ill-effects due to smoking have obviously been magnified, and in some instances ancient surmises, long discredited, have been revived by this circular; but the argument of economy excuses all this.

Public Health Services.

REPORTS OF SCHOOL MEDICAL OFFICERS.

Hull.

Dr. J. W. Fraser reports that the only condition where any deterioration has been found since last year is in the state of the children's teeth. Cleanliness is no worse, nutrition slightly better, there has been no special prevalence of disease, and fewer children have required school meals. 14,169 children were examined in the code groups, 4796 special examinations and 4150 re-examinations being made; 10·3 per cent. of the code group were found to require treatment. A system of payment for treatment at the clinics has been introduced, and the figures available for the first two months of the new system show a marked fall in the number of attendances. Attendances for minor ailments fell from 14,477 in the two months to 12,871, and dental attendances from 1394 to 1296. It remains to be seen whether an apparent fall in the incidence of disease is or is not attributable to the introduction of the payment system. The number of cases of skin disease, which had mounted so high after the war, has now happily dwindled to below pre-war figures. The two school dentists report a continual decline in the state of the children's teeth, a relapse which has steadily been taking place for the last three years. The number of 5-year-old children brought to the dentists' notice during the year suffering from extensive dental caries has been alarmingly large; many of them have exhibited an almost complete absence of enamel formation. It would be interesting to know to what this condition among the 5-year-old group can be definitely attributed, and whether it is a condition noted by school dentists in other parts of the country or is indigenous to Hull alone. The report by Mr. Bates, the organiser of physical training, shows a remarkable extension of out-of-school activities.

School playgrounds can be used between 4 and 6 in the evenings, if necessary. With one exception, every senior department—boys and girls—in Hull sent a class or classes to the baths each week throughout the year. There were 1280 in the learners' swimming classes, and 2218 certificates were issued. Mr. Bates was allowed two months' leave of absence in order to study the work of the Playgrounds Association in Canada and the United States.

Warrington.

In all serious cases of measles in Warrington the parents are offered hospital treatment or the services of a district nurse. Children convalescent from infectious disease are seen by the school medical officer before returning to school, as are contacts with infectious disease suspects and children with sore-throats. The number of deaths among children of school age in the borough was the lowest recorded in the past ten years. The system whereby the nurses deal with cases of minor ailments in the schools has resulted in an extraordinary decrease in the numbers attending the clinic. In 1921 there was a total of 22,203 attendances, against 4150 in 1923. The children are attended to by the nurse twice a week in the schools. Dr. G. W. N. Joseph rightly regards the aim of all modern public health work as educational and designed to strengthen self-reliance. The danger of lessening parental or personal responsibility is borne in mind, and when the cases and the home are suitable they are referred for treatment in their own homes under the supervision of the nurses; 320 cases, most of them pediculosis capitis, were dealt with in this manner.

Margate.

Mr. Rowan McCombe considers that the children of to-day are better fed, better clothed, and cleaner than they were 10 or 14 years ago, although he doubts whether their parents are in any better circumstances. We wish he had been able to include "better housed." In spite of frequent visits to the schools of the school nurse and doctor, uncleanliness has been more prevalent during 1923, and Mr. McCombe deplores the fact that the authorities have no power to cut the hair of children in a verminous condition. The method of excluding unclean children from school and prosecuting the parent for non-attendance he considers clumsy and ineffective, and to use the powers given to the Education Authority under the 1908 Children Act would necessitate the employment of an extra nurse. About 80 per cent. of the parents attend medical inspection; this is encouraging and shows the interest being taken in the school medical officer's work in Margate.

Grimsby.

Here there is no scheme for dental treatment. Twenty-one per cent. of the children examined in the routine group had more than four decayed teeth, but on account of the lack of facilities for treatment only 9·6 per cent., the very worst cases, were referred for treatment. Altogether 4102 children were inspected in the code groups, and 22·08 per cent. required treatment; 12 mentally and physically defective children were reported to the authority during 1923. Apart from six children suffering from non-pulmonary tuberculosis who have been sent to sanatoriums, no provision has been made for cripples. Of nine children "suitable for training in a school or class for the totally blind," three are attending the ordinary elementary schools, and four coming under the same category are apparently receiving no instruction at all; two are in attendance at certified schools or classes for the blind. Special provision for defective children is urgently required here. Dr. B. C. Stevens reports more cases of malnutrition, but bad cases are the exception.

Cambridge.

Dr. A. J. Laird reports that the most notable features of the work for 1923 have been: (1) the steadily increasing use made of the clinics; (2) the greater readiness of parents to obtain treatment; (3) the elimination of ringworm as a serious cause of loss of attendance; (4) the maintenance of a high standard of cleanliness. The attendance at his clinic showed an increase of 611 children, 2523 children having been treated there. Dr. Mabel Gurney, the assistant medical officer, expresses the opinion that the slight reductions in the heights and weights indicate a falling off in the general physique of the children since the war, and attributes this to unemployment. According to the figures given, while there are fewer above the average, 8·7 per cent. against 15 per cent. in 1914, there are also fewer below, 4·3, as against 17 per cent. in 1914. Dr. Gurney comments on the insufficient amount of sleep some children get. Parents do not always realise the need to overcome the opposition every child makes to being sent to bed early. Among the older girls many demands are made upon their spare time by music lessons, Girl Guide and other meetings. Dr. Gurney has here laid her finger on an important point. It seems unfair that these activities, which are generally part and parcel of the school life at secondary or private schools, should only be available in the evenings for the elementary school child, who is often overburdened with home duties as well. It is impossible for elementary school-children to get to bed in time if they are intelligent enough to take an interest in activities outside school; such activities should be incorporated in ordinary school life. The number of children examined at dental inspections during the year was 4923. It was found that the percentage of children with four or more teeth decayed was 8 per cent. less than in 1922. Dr. Laird has gone very fully into the question of the prevention of dental decay. He has come to the conclusion that tooth-brush drill is impossible in schools owing to: (1) expense of outfit; (2) lack of suitable accommodation; (3) inutility, except from an educational point of view, and he suggests that instead tooth-brushes should be supplied to children at cost price. It is possible, however, that the educational value of tooth-brush drill alone is worth the time and money spent on it.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 28TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 65; scarlet fever, 1356; diphtheria, 692 (as against 651 of the previous week); enteric fever, 181 (as against 133 of the previous week); pneumonia, 677; puerperal fever, 46; cerebro-spinal fever, 11; acute poliomyelitis, 10; acute polio-encephalitis, 2; encephalitis lethargica, 132 (as against 161 of the previous week); ophthalmia neonatorum, 116. There were no cases of cholera, plague, or typhoid fever notified during the week. Of the 65 cases of small-pox, 24 were notified from the county of Derby (Derby 9, Chesterfield 12, Chesterfield R.D. 2); 2 from the county of Durham (Stockton-on-Tees); 9 from Middlesex (Willesden); 11 from Northumberland (Ashington); 2 from Nottingham (Hucknall); 13 from Yorks, North Riding (Middlesbrough 11, Eston 2). Of the cases of encephalitis lethargica, 26 were notified from the County of London (Camberwell 1, Finsbury 1, Fulham 2, Greenwich 1, Hackney 2, Hammersmith 1, Holborn 1, Islington 3, Lewisham 1, Paddington 1, St. Marylebone 3, St. Pancras 2, Shoreditch 2, Southwark 1, Stepney 3, and Woolwich 1); 6 from the county of Durham (Gateshead 3); 4 from Essex (Walthamstow 2); 5 from Bristol; 18 from Lancaster (Liverpool 7, Manchester 1); 8 from Middlesex (Tottenham 4); 2 from Norfolk (Norwich); 2 from Newcastle-on-Tyne; 13 from the county of Warwick (Birmingham 11); 12 from Yorks, West Riding (Leeds 3, Sheffield 3); and 2 from the city of York.

Deaths.—In the aggregate of great towns, the deaths from influenza numbered 30, while the deaths from diphtheria fell from 29 to 20.

THE Chelsea Hospital for Women has received from the Court of Common Council of the City of London £105 towards the fund (£20,000) being raised by the Lord Mayor for the completion of the Nurses' Home and opening of additional wards; £8300 are now required.

Correspondence.

"Audi alteram partem."

DISINFECTION IN SCARLET FEVER AND DIPHTHERIA.

To the Editor of The Lancet.

Sir,—Dr. Duncan Forbes's paper in your last issue opens up again a field of discussion which is much wider than the transference of responsibility for disinfection from the local authority to the mother of the infected child, and for this reason, although with some hesitation, I submit the following observations.

Dr. Forbes does not suggest that the infectivity of scarlet fever or diphtheria is negligible. On the contrary, his pamphlet of 1909 gives very specific instructions to the housewife how to deal with infected articles. She, however, has her limitations; "books are difficult to disinfect" and they should be collected by "the Public Health Department." But just as some housewives would find it difficult to disinfect books, so many more (in some districts at least) would find it difficult to carry out the surgical spring-cleaning recommended, and in individual cases the decision would resolve itself into a question of expediency to be determined by the domestic facilities for carrying out the requirements.

In the argument, however, considerable importance is attached to the healthy carrier and the missed case in the spread of disease, and it is just precisely how far either is to be accepted as valid for all infections not otherwise explained that their use as a plea for reduced stringency in disinfecting measures becomes important. No one, indeed, questions the importance of either as a factor in spread, but will both together explain the recurring extensive waves of scarlet fever through several decades, or the rise in diphtheria, in Scotland at least, since the early years of the century?

Moreover, is a healthy carrier, even with his wider range of action, likely to be more effectual in transmitting disease than the clinically diseased person at close range? The argument would be valid had we evidence that these diseases spread by contact only. But contact alone will not explain even the autumnal rise in scarlet fever, still less its recurring extensive prevalence at intervals of years. And the increase in prevalence of diphtheria in Scotland took place after the healthy carrier had already established for himself a place in such inquiries. Both diseases illustrate, indeed, how very elementary is our knowledge of the life-history of the infecting organisms.

As a further illustration, in which the theory of the healthy carrier has also been advanced as an explanation of spread, take the present distribution of encephalitis lethargica in this country. What is the picture presented? A few cases are recognised widely separated from each other and with no discoverable association between them. Subsequently, in the neighbourhood of some, but not all of them, other cases occur, equally detached. It is rare that two cases occur in one family, but aggregations of cases within comparatively limited fields are not uncommon. Are we to ascribe this massing to healthy carriers in the district, when the clinically infected person almost uniformly fails to infect his own family? A spot map of such illustrations of endemic plague as we have experienced in this country would present just such features as I have tried to suggest of the distribution of encephalitis lethargica. Did we not know of the part played by the rat and its parasite, sporadic cases of plague would excellently illustrate the theory of the healthy carrier.

Our knowledge of some of the channels through which infection spreads is pitifully inadequate to explain the fluctuations in disease prevalences which occur, and it seems to me that until we have a wider knowledge of the life-history of infecting organisms, every step which would tend to suggest that infectivity was a comparatively trivial matter is to be taken in view of the whole problem and not of any particular aspect of it.

We dismiss the desquamating child from hospital because there would appear to be some evidence that certain stages of desquamation are not associated with infectivity. We find cases of scarlet fever grouping themselves round a particular class or department of a school and proceed to search for the desquamating child, often finding him without suggestive throat condition, and stop the occurrence of further cases by removing him. As facts of observation, these two illustrations appear to be contradictory, but they would undoubtedly find a common explanation did we know the life-history of the infecting organism. This has, I fear, travelled far beyond Dr. Forbes's suggestion of a comparative trial of domestic *v.* municipal disinfection, although it represents to me, at least, the mental attitude in which I think the question should be approached.

Finally, is it not worth asking what would be the effect on the mind of the housewife of proclaiming an infectivity which was to be combated by a restricted spring-cleaning?

I am, Sir, yours faithfully,
A. K. Chalmers,
July 5th, 1924. Medical Officer of Health, Glasgow.

To the Editor of The Lancet.

Sir,—Few readers will be inclined to disagree with the conclusions and practice explained by Dr. Duncan Forbes in his communication on the subject of disinfection, and one might almost feel confident in expressing the view that the practice which he indicates is that which is followed in a very large number of instances. The interesting volume published by Dr. C. V. Chapin, of Providence, U.S.A., in 1910, on the *Sources and Methods of Infection* is well worth perusal in connexion with Dr. Forbes's subject.

It will not be lost sight of, however, that in certain localities, for example, amongst the dockside labouring population of a large seaport which, in its habits and customs, differs widely from those of a fashionable health resort, the practice of disinfection goes far to encourage domestic cleanliness, and the processes which destroy vermin of various kinds are far from being without useful effect.

I am, Sir, yours faithfully,
E. W. Hope,
July 7th, 1924. Medical Officer of Health, Liverpool.

"INDUCTION" OR "CAUSE" OF CANCER.

To the Editor of The Lancet.

Sir,—Dr. A. Leitch (June 28th) is pleased to have his little jest about my lamb, but it is only kind to inform him that this is fast growing into a sturdy sheep, and will soon be strong enough to butt anyone who treats it disparagingly! This is not merely fond parental opinion; it is also the view of several biologists and pathologists fully competent to judge. The story of the photographic expert is highly amusing, but, unfortunately, it appears to me to be distinctly unapt, if meant to apply to my case. Had I ever ventured to discuss the clinical and macroscopic aspects of malignancy, the matter would be different. But observation of cases of cancer is not an indispensable requisite for the study of the behaviour of the cancer cells themselves. Dr. Leitch, as an eminent pathologist and bacteriologist, will know in how very many instances the actual cause of a disease can be determined in the laboratory without any visit to the bed-side being necessary.

As a matter of fact, my paper on malignancy (*Jour. R.A.M.C.*, vol. xli., October, 1923) was based in part on valuable sections most kindly lent me by Dr. Leitch himself; and what I have seen is there to be seen by others. It is all a question of being able *rightly to interpret what is happening!* I know quite well, of course, that microscopical study can only furnish indications, not proof. But may I just add, in view of the trend of Dr. Leitch's remarks, that, while I would not in the slightest degree minimise the importance of the macroscopic study of malignant growths, I think the method of pondering the appearances shown by the cancerous cells, under a high power of the microscope—a study which seems to have almost gone out of vogue in these days—is one which can still give most helpful results. Particularly would this seem to me to be the case, if we remember that the malignant *condition* is the expression of some unusual manifestation of cell life—to which view, I take it, Dr. Leitch would subscribe. Has any other method of attacking the problem brought us anywhere near knowledge of the actual cause? Ought one, therefore, to neglect any line which may bring us nearer to the truth?

I am, Sir, yours faithfully,

London, June 30th, 1924. H. M. WOODCOCK.

SIMMINS APPEAL FUND.

To the Editor of THE LANCET.

SIR,—Under the above heading a remark occurs which might imply that the benefits derived from the Royal Medical Benevolent Fund are enjoyed by subscribers only, and that in this sense the fund is a provident institution. On the contrary, the annual report sets out the operation of the Fund in the following words: "The Fund is a general charity, the benefits of which are *open to all* deserving cases without restriction. Other medical charities are for the most part local, and of the nature of provident clubs, the benefits of which are restricted to subscribing members."—I am, Sir, yours faithfully,

CHARTERS J. SYMONDS,
Hon. Treasurer, R.M.B.F.

11, Chandos-street, Cavendish-square, W.,
June 30th, 1924.

SOME FUNDAMENTAL FACTORS IN THE SPREAD OF INFECTIOUS DISEASE.

To the Editor of THE LANCET.

SIR,—May I answer Dr. E. W. Goodall's kindly criticisms in THE LANCET of June 28th of my paper on the above subject. He quotes a paragraph which, he says, implies that "several infectious diseases, no matter what nature, could be nursed safely in the same ward." There was no intention of meaning this, and it was considered that the addition—"provided the beds *are far* enough apart"—enabled the statement to be generalised. Under the ordinary conditions of bed isolation treatment I accept unreservedly Dr. Goodall's amendment of the sentence—namely, "that it is possible so to nurse several different diseases." Bed isolation was introduced to illustrate a principle; I had no intention of discussing its practical limitations. I had read the discussions on bed isolation, which Dr. Goodall referred to, and found much in them to support the theories brought forward in my paper. I realise that in beds 9 *or* 12 feet apart certain cases, such as those suffering from chicken-pox, cannot safely be nursed in company with other patients. Dr. Goodall further thinks that I imply that "infection is to all intents and purposes always conveyed by heavy droplets at short range." The actual words used in the paper were: "The short-range jet of heavy droplets is the *usual* means by which so-called contact infection is acquired." Perhaps I should have added, "in many of those conditions in which the dependent organism is disseminated in buccal and respiratory discharges of the host." But I hoped the whole context suggested this limitation. The above proposition is not proved, but one of the objects of the paper was to indicate evidence in favour of it.

Dr. Goodall thinks that a term allowing for microbic multiplication should be introduced into the formula for velocity of infection. When either the resistance of the host or the infective intensity of the parasite increases or diminishes, a negative or positive acceleration of the velocity of infection will result, but the formula as it stands fulfils its purpose, which is to show as simply as possible how time can be a factor in acquiring parasitic infections. The use of round numbers was a clear method of explaining the principle of velocity of infection. It is unthinkable that anything so simple should actually happen, as that, of 100 microbes received, 50 are completely destroyed and 50 retain their infective intensity unchanged and that no multiplication occurs throughout the chosen unit of time. The original number of microbes may even increase; at the same time, their infective intensity may actually diminish under the action of the environmental conditions found in the host. This, however, is only guessing because what really happens is unknown.

I think Dr. Goodall overlooked my attempt to define virulence, which was as follows: "For the present purpose virulence may be defined as the extent to which a parasite can injure the host"—a purposely elastic definition which would have been improved by inserting "average susceptible" before host.

Perhaps an apology is due to Dr. Goodall and your readers for attempting to deal with so large a subject in so short a space. In the opening paragraphs of the paper I confessed I would have to be brief and dogmatic. The object of the paper was to indicate certain principles; there was no time to discuss their limitations in practice, or the application of them to special cases. I would like to add that most of the theories brought forward were, in the main, deduced from the experience gained during the 1918 influenza epidemic. In the case of diphtheria the Schick test enabled much more definite evidence to be collected in favour of the conclusions I arrived at from the study of other diseases.

I am, Sir, yours faithfully,

S. F. DUDLEY.

Royal Naval College, Greenwich, July 3rd, 1924.

THE FUTURE OF THE INDIAN MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—I should be obliged by your permitting me to add a few remarks to the editorial note on the above-mentioned subject which appeared in THE LANCET of May 31st, 1924.

Some influential daily papers have been clamouring for an expeditious ratification of the recommendations contained in the Lee Commission's Report. The Commissioners themselves, probably prompted by the strained conditions they found during their comprehensive and invaluable investigation, also urged an early decision regarding their proposals. All who are familiar with the present position of affairs must be in full sympathy with a desire to arrive at a settlement of the many questions dealt with as soon as possible. Nevertheless, many will consider that this is a case in which wisdom lies in making haste slowly.

The report proposes the introduction of changes of grave importance in the All-India Services on the civil side, and particularly in the Superior Services of Provincial Governments. We are specially concerned with the proposed abrogation of the Indian Medical Service and the assistant surgeon branch of the Indian Medical Department, a change which common sense alone indicates should not be made without complete deliberation as to its immediate and ultimate effect on medical work in India.

I will not burden your readers with any opinion on the proposals contained in the Lee Commission's Report regarding the Medical Services, beyond stating that they provide for what should prove to be a perfectly organised and efficient military medical service in India if it includes the assistant surgeon branch of the Indian Medical Department (no adequate reason appears to be given for not including it), but the changes proposed for the Civil Medical Service are such as many experienced officers of the Civil

Services may consider will lead to stagnation, and possibly to rapid retrogression of Western medicine in India. The medical administration of the military side deals with approximately 300,000 men; the civil medical administration deals with a few hundred millions of people. Whilst undue haste is to be deprecated in dealing with the Lee Commission's Report, it is earnestly hoped that it will not share the fate of some of its predecessors, which became obsolete before any action was taken on them. Political opinion in India is shifting rapidly. Many serious questions hang on the decisions to be arrived at—recruitment, financial relief, leave, &c.—of the European services; the settlement of these should meet with no unnecessary delay.

The Lee Commission's Report will not be discussed in the Central Legislative Assembly in India until next September, and I understand that neither the Secretary of State for India nor the Government of India will take any action on the proposals until this discussion is over. It is highly probable that certain Indian politicians will attempt to withhold the grant of concessions to the European Civil Services until their demand of February last for further constitutional advance has been conceded.

I am, Sir, yours faithfully,
P. HEHIR,
Major-General, I.M.S. (ret.)
Westward Ho! July 5th, 1924.

SPINAL ANALGESIA.

To the Editor of THE LANCET.

SIR,—I was extremely interested in the article by Mr. B. H. Slater on spinal analgesia in THE LANCET of June 21st and your comments thereon. I think, however, that the views put forward are unduly optimistic. For instance, the general statement is made that "it is safer than general." While admitting that reliable statistics are extremely difficult to obtain, I doubt whether the most enthusiastic "spinal" advocate would claim a lower total mortality due to the method than 1 in 500. As a matter of fact, I know of several series of cases showing a considerable higher mortality. Turning now to general anæsthesia, the average immediate and remote mortality due to the anæsthesia (partly or entirely) ranges from 1 in 1500 to about 1 in 4000 in most London hospitals. Again, the statement is made that "there are no chest complications." I have myself seen four cases of serious chest complications following spinal analgesia, one of which was fatal. It is true that pulmonary complications are, on the average, less with spinal than with general anæsthesia, but is this not due to the fact that the former method is seldom used in operations involving much interference with the diaphragm and adjoining peritoneum—e.g., gastrectomy, cholecystectomy, splenectomy, &c.?

Mr. Slater also says that "there are practically no anæsthetic anxieties." I think that most anæsthetists will agree that spinal cases involve more worry than do "general" ones. Few situations are so unpleasant as to have a spinal patient with a progressively falling blood pressure in spite of an exaggerated "Trendelenburg" position. Complete muscular relaxation is also claimed as an advantage of spinal analgesia, but is by no means confined to this method. Endotracheal gas-oxygen with a surprisingly small amount of added ether provides the most complete relaxation that can be demanded, and does so with absolute certainty, owing to the perfectly clear airway which is at all times assured.

Finally, it is suggested that if the technique be correct, there are no disadvantages to spinal analgesia except some extra work. The following complications have all occurred, some of them fairly commonly: (1) Pulmonary troubles, including bronchitis, pneumonia, embolism, and acute pulmonary œdema. (2) Sudden cardiac failure during operation. Practically all cases show marked fall of blood pressure soon after the injection of the drug. (3) Alimentary complications. Vomiting is not uncommon during the operation and may prove embarrassing. Post-operative paresis of the gut and incontinence of fæces are rarer but more dangerous events. (4) Urinary complications. Loss of bladder control has occasionally led to ascending infection. (5) Various ocular paralyses leading to persistent strabismus, diplopia, and ptosis. (6) Persistent headache. One other indirect complication is reactionary hæmorrhage. Where the fall of blood pressure is marked, vessels may not bleed at the time of operation, but begin to leak when the patient is back in bed. Such a case proved nearly fatal quite recently.

It may be contended that these unfortunate events only occur when the technique is faulty. This, however, is not so, as the mortality has not been appreciably lowered by using "heavy" solutions or by employing the various substitutes for stovaine which are now on the market. I think that enough has been said to indicate that while spinal analgesia may be an admirable procedure for selected cases in skilled hands, yet it is by no means devoid of risk.

I am, Sir, yours faithfully,
C. LANGTON HEWER.
York-terrace, Regent's Park, July 4th, 1924.

THE WORK OF WELFARE CENTRES.

To the Editor of THE LANCET.

SIR,—Welfare centres have undoubtedly been of enormous value in reducing infant mortality, and of still greater value in raising the physical standard of the children, but I venture to suggest that more could be done if it were possible to standardise the advice given by doctors, midwives, and health visitors. All these are advising to the best of their ability, and the advice they give necessarily varies with their experience. Most of the work at an infant welfare is concerned with healthy infants, those that are really sick being taken usually to hospitals for treatment. The mothers of the healthy infants desire to know if what they are doing is the best for their babes. It is reasonable to suppose that the average infant of healthy parents is born healthy, and that subsequent minor ailments are due to lack of knowledge of the best way to feed, clothe, and house the infant on the part of the mother. Infants are like any other healthy young animals, and at any rate up to nine months could all be reared exactly alike without any distinction being made between them as regards diet and clothing.

As examples of the type of question asked by mothers, I select the following as illustrating the need of a standard.

1. What is the best time-table of infant feeding at birth? The answers vary from two-hourly during the day and twice at night, to five feeds a day at four-hourly intervals and none at night. On the latter time-table the infants thrive well and there is no question which is the more restful to the mother.

2. At what age should a healthy baby be weaned, and when should it be given such articles of diet as meat, potatoes, bread, and so on?

Here the variation in the advice given by individuals must be very great, so great, in fact, that the opinions of two doctors each running a welfare centre in the same town can be, and often are, diametrically opposed to each other, while midwives in the same centre each have their own opinions. These opinions are not concerned with the treatment of sickness about which there must be very often wide differences, but with the diet of a healthy child. I expect to be considered wrong in so advising, but I find that meat, chopped fine, is digested and well liked by many infants from nine months upwards.

There is, too, a great sum of money wasted annually in almost every household upon various medicines, particularly aperients. These latter are given for no reason whatever, more often than not with the mistaken idea of keeping a baby fit. If there should be a reason, what is required is some alteration in the diet rather than an aperient. They certainly do far more harm than good, when given indiscriminately, and can quite reasonably be supposed to lower the physique, and make the infant more liable to piles later on in life. The ideal should be a normal action of the bowels without any medicine whatever, when if an aperient should be necessary for illness at any time its efficiency is so much greater. As an extreme instance, a mother informed me last winter that she was unable to afford any woollen garments for her children, but stated, with evident pride, that she was able to afford a 3*s*. 6*d*. bottle a week of some lung tonic to prevent them catching colds.

It is suggested that some competent body should issue a small cheap book stating exactly what is the ideal life time-table of a *healthy* infant, breast-fed and bottle-fed, with practical and economical advice *re* clothing, &c., from birth up to 2 years. I believe this would fill a much desired want on the part of mothers and welfare staffs and might obviate some of the defects of infant life which still permit a mortality of 69 per 1000 births.—I am, Sir, yours faithfully,

Southampton, July 6th, 1924. A. G. G. THOMPSON.

THE PROBABLE DUAL CONSTITUTION OF INSULIN.

To the Editor of THE LANCET.

SIR,—It has been assumed that since insulin administered by the mouth does not induce a fall in the sugar-content of the blood similar to that which results when it is given intravenously or hypodermically, it has no influence upon metabolism, and is either not absorbed by the mucous membrane of the alimentary tract or is destroyed by the digestive secretions. The metabolic experiments on animals upon which I have been engaged for some time in association with Mr. H. A. H. Howard, B.Sc., suggest that this conclusion is not entirely correct, for from observations on the respiratory quotient in a series of guinea-pigs and rats to which insulin had been given by the mouth it was found that, although there was no diminution in the blood-sugar, the effects of a subsequent injection of adrenalin were counteracted in much the same way as in animals to which insulin had been administered hypodermically. It would therefore seem that insulin may be absorbed through the walls of the alimentary tract, but that its properties are modified in the process, or, what is more probable, a fraction which promotes the utilisation of sugar by the tissues is destroyed, while another fraction which is able to neutralise the glycogenolytic effect of adrenalin passes into the circulation unchanged.

Six guinea-pigs, with an average fasting respiratory quotient of 0·73, gave an average respiratory quotient of 0·81, with the usual drop in the blood-sugar, after two units of insulin had been injected subcutaneously, and 0·81, with increases in the blood-sugar ranging between 0·14 and 0·18 per cent., after a hypodermic injection of 0·25 c.cm. of adrenalin. When insulin and adrenalin were injected in succession there was little or no change in the sugar-content of the blood or in the respiratory quotient if the doses were correctly adjusted, showing that the hypoglycæmic effect of the adrenalin had been neutralised by the insulin and that less carbohydrate was being utilised than when either was given separately. In the same series of animals the administration of two units of insulin by the mouth at hourly intervals for three hours was found to have no influence upon the sugar-content of the blood or upon the respiratory quotient, but when a hypodermic injection of 0·25 c.cm. of adrenalin was given 15 minutes subsequently the increase in the respiratory quotient, which should have developed if the adrenalin were acting unchecked, failed to appear, the average for the six animals working out at 0·735, or practically the normal fasting value. It was therefore evident that, although insulin given by the mouth had no effect upon the sugar-content of the blood, it was capable of preventing the glycogenolysis consequent upon the introduction of a potent dose of adrenalin into the circulation.

Similar results were obtained with white rats. The average respiratory quotient of three of these animals worked out at 0·77 in the fasting state. A hypodermic injection of two units of insulin produced a characteristic fall in the blood-sugar and a rise in the respiratory quotient to 0·82, while a hypodermic injection of 0·25 c.cm. of adrenalin was followed by an increase in the sugar-content of the blood and an average respiratory quotient of 0·82. Two units of insulin given by the mouth for three hours produced no alteration in either the percentage of sugar in the blood or in the respiratory quotient, and when 0·25 c.cm. of adrenalin was injected a quarter of an hour later there was still no change, an average respiratory quotient of 0·77 being obtained, demonstrating that in these animals, as in guinea-pigs, insulin administered by the mouth was capable of influencing carbohydrate metabolism, although only so far as its anti-glycogenolytic properties were concerned.

If, as these experiments indicate, the anti-glycogenolytic fraction of insulin taken by the mouth enters the circulation, while the sugar-utilising fraction is destroyed, or at any rate is not absorbed, it is possible to account for the beneficial effects claimed to have resulted in some cases of diabetes from the oral use of crude extracts of insulin, such as that of Mackenzie Wallis, and from the administration of raw pancreas, or preparations of the gland, by the mouth, for the anti-glycogenolytic portion being effective such treatment would be likely to be helpful where the hyperglycæmia was dependent upon defective storage of glycogen and there was no interference with sugar utilisation. It would, however, be of little or no value in cases in which there was defective utilisation as well as over-production of sugar, thus explaining the failure of oral treatment with pancreatic preparations where actual disease of the pancreas existed.

I am, Sir, yours faithfully,

July 4th, 1924. P. J. CAMMIDGE.

DEAFNESS IN SCHOOL-CHILDREN.

To the Editor of THE LANCET.

SIR,—May I, as one who has had some experience of the needs of the deaf child in elementary schools, be permitted to comment upon the report of Miss E. Lowry's paper in THE LANCET of July 5th (p. 20)? What I have to say may be best summed up under five heads.

1. There should be more adequate provision for removal of tonsils and adenoids, both at hospitals and in school treatment centres throughout the country, and the cases operated upon should be followed up.

2. These operations should be done by experts. In my experience many such operations are inadequately performed, and it is quite common for mothers to state that their children's deafness was "made worse" by the treatment. Moreover, it is by no means uncommon to find children who have been operated upon not twice, but three times. In many cases, also, the operation appears to have been the be-all and end-all, the deafness being left to get well by itself.

3. In school treatment centres, ear conditions should be treated by *specialists*. Harm has been done by classing ear troubles as "minor ailments," which they most distinctly are not. There is no dearth of competent young specialists to take charge of these centres.

4. Efforts should be made to deal with the child of pre-school age, with the definite view to preventing the conditions which lead to deafness.

5. More effort should be made to discover cases of early deafness in the schools. This, as I have pointed out repeatedly, could be done by introducing a whisper test during the vision-card test; or, as in France and Chicago, by means of games. I pointed this out in my "Plea for the Deaf Child" two and a half years ago (THE LANCET, 1922, i., 1027). These

tests are best done by the teacher, whom the children know and trust, rather than by the doctor, with whom they are apt to be shy. Children found wanting can be handed to the medical authority for more detailed examination. Deaf children could thus be discovered when treatment is of use and a large number of cases of deafness could thus be prevented. At present, these children go unrecognised, often until too late.

I may add that it is a matter of great gratification to me to find that the attention of otologists is becoming aroused to the necessity of prevention. I have been preaching it for the past 15 years, as has my friend Dr. Kerr Love in Scotland.

I am, Sir, yours faithfully,
MACLEOD YEARSLEY, F.R.C.S.
Wimpole-street, W., July 7th, 1924.

RESEARCHES ON LEPROSY AND THEIR BEARING ON THE TREATMENT OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—May I draw attention to a statement in Sir Leonard Rogers's lectures (THE LANCET, June 28th, p. 1297) in which he credits me with the statement that "the addition of 3 per cent. solutions of sodium gynocardate, morrhuate, or oleate to a pancreatic extract doubled the fat-splitting effect of the pancreatic lipase on an emulsion of olive oil." The accelerating action of sodium oleate on lipase varies considerably according to the percentage strength of the solutions used, and so far from using 3 per cent. strength solutions, 0·9 per cent. strength solutions were used in my experiments. My statement in the paper[1] referred to by Sir Leonard Rogers is "Systematic investigation of sodium oleate had previously shown that the accelerating action on extract of pancreas varies considerably according to the percentage strength of the solutions used; graduated amounts added to the extract show also a gradual rise in values up to a maximum, falling ultimately to nothing. I chose, therefore, a 0·9 per cent. solution of sodium oleate which had given good results formerly, and the same percentage solutions of sodium morrhuate and sodium gynocardate, using 1 and 2 c.cm. amounts of these solutions." Obviously the matter is of importance also in therapeutic dosage. He says further that these experiments in vitro led me to suggest a stimulating action of tissue lipolysis in part explanation of the therapeutic effect of sodium morrhuate and sodium gynocardate on acid-fast bacilli, and led him to investigate the possibility of these substances also stimulating the production of fat-splitting lipase in the blood of leprosy and tubercle cases, whereas, as a matter of fact, in my paper, after giving the actual results in my experiments in vitro, I went on to say that in view of the ascertained action of sodium oleate in vivo,[2] "it would seem reasonable to infer a direct stimulating action of tissue lipolysis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and of sodium gynocardate, in addition to a direct destructive action claimed for both (Rogers) or for the chaulmoogrates alone (Walker and Sweeney) on acid-fast bacilli."

I am glad to see the confirmation of the lipase theory by Sir Leonard Rogers in the particular case of leprosy, which I have so long pointed out and maintained in cancer, tuberculosis, and other infectious diseases. I may, perhaps, be permitted to add that in 1912 I showed that in recovered tuberculosis the lipolytic activity of the serum is increased. Somewhat later it was found to be decreased in the acute stages, as well as (1914) in T.B. infected guinea-pigs and rabbits examined in the bacteriological laboratory, King's College. In my culture experiments also lipase killed tubercle bacilli.

I am, Sir, yours faithfully,
J. A. SHAW-MACKENZIE, M.D. Lond.
London, July 4th, 1924.

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[1] Med. Press and Circ., August 18th, 1920.
[2] Proc. Physiol. Soc., Jour. Physiol., xlii., p. 11.

Obituary.

CHARLES HUNTER STEWART, D.Sc., M.B., C.M. EDIN.

BY the death of Dr. Charles Hunter Stewart, professor of public health and sanitary science and director of the John Usher Institute of Public Health, the University of Edinburgh has suffered another loss. Although he had been in poor health for some time, his death on June 30th at his residence in Melville-street, Edinburgh, came quite unexpectedly.

Prof. Stewart was born in Edinburgh in 1854, and educated at the University of his native city, while later he studied extensively on the continent. He first underwent training as a pharmaceutist, but, forsaking materia medica and chemical pharmacy, he applied himself with marked success to the study of experimental science and medicine, graduating Bachelor of Science in 1882, Bachelor of Medicine in 1884, and Doctor of Science in 1894. In 1880 he won the Hope Prize Scholarship in organic chemistry, and four years later the Mackay-Smith scholarship in chemistry. His early scientific training made him a keen observer and a most painstaking investigator. When in 1894 the University of Edinburgh decided to institute a public health laboratory in connexion with the chair of forensic medicine he was chosen by Sir Douglas Maclagan, then professor of medical jurisprudence, to organise and conduct the instruction in it. In 1898 he was appointed to the newly founded Bruce and John Usher Chair of Public Health, and he occupied that chair till his death. In 1902 he became also director of the Usher Institute of Public Health, to the planning and arranging of which he devoted a large amount of time and thought, the result being the provision of laboratories, which at that time were regarded as perhaps the finest in the country.

His colleague, Dr. J. Buchanan Young, writes: "In experiment Prof. Stewart was resourceful, and above all accurate, and he demanded the same accuracy in working from those whom he trained. As a young man he had worked hard, and he never failed to impress on his students the necessity for hard work if success was to be attained, and he took a keen interest in following the careers of those whom he had taught. His prolonged study in continental laboratories and his vast experience in laboratory work made him quick to appreciate improvements in processes and methods, but before any new methods were introduced into his courses of instruction they had to be thoroughly tested by himself as to accuracy of the results given. For many years he was well known and much sought after as an expert witness before the Scottish courts in river pollution cases, and in reference cases involving special knowledge of water-supply, &c. To the investigations connected with these he devoted a large amount of time and energy. The number of experiments he conducted, and the amount of labour and time he expended in satisfying himself as to the soundness of the views he expressed in evidence, were only known of by those who were associated with him in such work. His favourite reply when asked if it was absolutely necessary to make a certain experiment, which to the inquirer seemed somewhat troublesome, was 'Prove all things'! In later years he devoted himself largely to the epidemiological and statistical departments of public health. His grasp of figures was marvellous, and his memory for figures rather 'uncanny.' As a lecturer he was emphatic in style, interesting, and insistent on salient points. He had a quiet, somewhat 'pawky' humour, and those who met him in private life found in him a most interesting conversationalist, willing to discuss practically any subject. During 40 years as a teacher in the University (26 of these as professor of public health) he had seen many changes in the Edinburgh Medical School, and had taught a very large number of students. We who remain are all the poorer by his passing."

In 1888 Prof. Stewart married the eldest daughter of the late Mr. G. Gorden Gibson, an Edinburgh civil engineer. Mrs. Stewart died in 1905, and seven years later Prof. Stewart married a daughter of the late Mr. Robert Somers, of Thrushville, Stirling, who survives him, and to whom we offer our sincere sympathy.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. H. J. Chater and R. W. G. Stewart to be Surg. Capts.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Comdr. W. E. Harker to be Surg. Capt.

Surg. Lt. Comdrs. J. B. Ronaldson and T. Turner to be Surg. Comdrs.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majs. and Bt. Lt.-Cols. to be Lt.-Cols.: D. S. Skelton, vice Lt.-Col. A. D. Jameson, to ret. pay; P. G. Easton, vice Lt.-Col. A. R. Greenwood, to ret. pay; and P. Davidson, vice Lt.-Col. and Bt. Col. F. McLennan, to ret. pay.

Maj. B. H. H. Spence is restd. to the estabt.

ARMY RESERVE OF OFFICERS.

2nd Lt. R. K. Wilson, late R.F.A., to be Lt.

MILITIA.

Capt. G. F. V. Leary to be Maj.

TERRITORIAL ARMY.

Capts. G. L. Malcolm-Smith (late R.A.M.C., S.R.), and D. S. Jones (late R.A.M.C.) to be Capts.; D. P. Levack and C. E. W. Bower to be Lts.

ROYAL AIR FORCE.

Squadron Leaders W. W. Shorten and F. N. B. Smartt to be Wing Comdrs.

Flight Lts. T. Montgomery and H. L. Burton to be Squadron Leaders.

Flight Lts. J. Craig and H. C. Perkins to be hon. Squadron Leaders.

Medical News.

UNIVERSITY OF OXFORD: *Radcliffe Scholarship in Pharmacology.*—The Master and Fellows of University College have awarded the Radcliffe Scholarship in Pharmacology in equal shares to Thomas C. Hunt, Magdalen College, and Alice D. K. Peters, St. Hugh's College, whose work was reported by the Professor of Pharmacology to be of equal merit.

Welsh Memorial Prize.—Dr. Lee's Professor of Anatomy has reported to the Vice-Chancellor that he has awarded the Welsh Memorial Prize for the best set of anatomical drawings in relation to human anatomy to Perer M. F. Bishop, Trinity College.

In the recent Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery, the following candidates passed the undermentioned subjects of the Final Examination :—

Materia Medica and Pharmacology.—J. W. Alden, B. H. B. Bettington, M. D. Bower, G. Campbell, N. Chilton, J. H. Chitty, R. T. V. Clarke, P. F. Cluver, G. H. Crisp, D. M. Dunlop, J. A. Eyres, A. C. Gairdner, P. S. Hamilton, H. E. Harding, R. Illingworth, J. H. Kennedy, G. L. M. MacElligott, C. W. MacKenzie, R. G. Mathews, J. C. Neely, B. V. O'Connor, F. G. Parker, R. C. Probyn-Williams, W. F. H. Ray, D. I. Rees, W. G. Rees, A. Reid, D. A. Robertson, F. J. Sale, T. H. Sellors, G. P. Thorold, R. L. Graves, M. N. Jackson, C. I. Pattullo, and A. D. K. Peters.

Pathology.—G. R. P. Aldred-Brown, E. N. Allott, H. N. Bradbrooke, A. V. Clemmey, P. F. Cluver, L. O. F. Fysh, T. C. Hunt, R. Lewthwaite, P. C. Mallam, M. J. W. Minshull, P. Morton, W. D. B. Read, D. A. Robertson, G. P. Roxburgh, J. de la Mare Savage, T. H. Sellors, C. W. Simpson, and R. S. Wordsworth.

Forensic Medicine and Public Health.—J. W. Alden, M. M. Baird, L. J. Barford, R. J. Brocklehurst, C. W. Carter, H. N. K. Elphick, K. J. Franklin, C. J. Fuller, J. R. B. Hern, P. H. Martin, J. D. Mills, H. W. Pearson, A. A. F. Peel, D. I. Rees, A. W. L. Row, T. E. Ryves, J. G. S. Thomas, E. C. Whitehall-Cooke, and G. P. Wright.

Medicine, Surgery, Midwifery.—G. R. P. Aldred-Brown, W. H. [illegible], W. H. Bradley, R. E. D. Cargill, C. W. Carter, S. H. Cattrall, J. L. Cox, C. L. Elgood, K. J. Franklin, A. T. [illegible], C. J. Fuller, D. R. Gawler, C. A. H. Green, F. H. [illegible], W. J. [illegible], H. W. Pearson, A. A. F. Peel, S. J. [illegible], I. M. [illegible], G. I. Wilson, and G. P. Wright.

UNIVERSITY OF DURHAM.—At the Convocation held on June 24th the following medical degrees were conferred :—

Doctor of Medicine.—Alan Angus, M.B., B.S., and Robert W. Locke, M.B., B.S.

Doctor of Medicine for Practitioners of 15 Years' Standing.—Henry H. R. Clarke, M.R.C.S., L.R.C.P.

Bachelor of Medicine and Bachelor of Surgery.—James R. Campbell, Oswald P. Chapman, Thomas L. J. Coxon, Ethel W. Daniels, Mary W. Dewell, George A. Gilmour, John C. Hall, Frances R. Henegan, M. Hopper, George E. Hyden, Ronald Keenlyside, Nora W. Kirk, John W. C. Leech, Thomas H. Meek, William Meikle, Thomas D. Miller, Guy Punshon, Margaret Ranken, James H. Saint, Margaret Scoresby-Jackson, Joseph A. Stobbs, Temperley Strother, Raymond L. Stubbs, and Edwin F. D. Walker.

Bachelor of Hygiene.—Margaret B. Herbst, M.B., B.S.

At the Convocation held on June 25th the following degrees were conferred :—

Doctor of Medicine.—Francis J. Benjamin, M.B., B.S., Roy N. Craig, M.B., B.S., Richard L. Dagger, M.B., B.S., William A. Jaques, M.B., B.S., and Thomas N. V. Potts, M.B., B.S., B.Hy., D.P.H.

Bachelor of Medicine and Bachelor of Surgery.—Thomas R. Aynsley, Elizabeth Bainbridge, William N. Booth, Joshua Carse, Stanislaus Curry, Archibald L. Fairlie, Thomas Fraser, James Henderson, Gordon C. Henry, John M. Johnson, Francis J. Lorriman, Kenneth V. Milburn, William C. Murray, John J. D. Naismith, Elsie L. Peet, John Reay, Matthew Ryle, Alfred Swindale, Geoffrey G. C. Taylor, and William A. Tweddle.

The following received the Diploma in Public Health (D.P.H.) :—

Margaret B. Herbst, M.B., B.S.

The following received the Diploma in Psychiatry (D.Psy.) :—

Reginald E. Illingworth, L.R.C.P. & S., L.F.P.S.G.

The following received the Licence in Dental Surgery (L.D.S.) :—

George A. Catcheside, James F. Coltman, M.B., B.S., Lionel G. Dewar, Wilton L. Milburn, Arthur T. Picton, and Alexander S. Robertson.

UNIVERSITY OF SHEFFIELD.—As a result of the recent final examinations for the degree of M.B., Ch.B., the following candidates were successful :—

With Honours (Class II.).—George E. Larks (with distinction in Gynæcology), Charles A. Lister, and Aaron S. Mushlin.

Ordinary.—Amy D. Baker, William F. L. Castle, George S. Davidson, Edward M. Dearn, Phyllis H. C. Eardley, Donald A. Grattan, Cornelia H. Greaves, Harry N. Green (distinction in Medicine), Edith Hatherley, Harold Kelson, John E. King, William W. Mathews, Herbert Mercer, John O. Schofield, and Bertrand R. Wallis.

Reginald E. Pleasance passed the examination for the M.D.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following were the successful candidates :—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—Robert L. Forsyth (passed on high marks), James E. McCauley, Ransome MacN. Allardyce, Annette K. Wood-Martin, Victor St. G. Vaughan, Richard G. Keays, Gilbert T. L. Archer, Barend P. Pienaar, Elspeth V. D. Hewat, Maiben A. W. Roberts, and Henry O. Clarke.

Part II., Medicine (M.B.).—Robert F. J. Henry (passed on high marks), Gordon Purdy, John K. S. Thompson, John L. Stuart, James S. Armstrong, John E. Beatty, Godfrey W. Garde, John R. Bradshaw, Edward Harvey, John Crawford, Charles J. du Plessis, John H. Bowyer, Leslie D. Dennard, Ralph A. Webner, Robert G. F. Thompson, Leslie M. Whitsitt, Gerrard A. Sloan, Alexander Hawthorne, Herbert W. Strong, Alfred J. Head, Lionel S. Levitt, and François J. Swanepoel.

Surgery (B.Ch.).—Gordon Purdy, John K. S. Thompson, Douglas L. Hemmingway, Maynard A. Gerrard, Robert E. Steen, Isidore Rosin, Desmond K. Lyons, John V. Morris, George A. Cowan, Alan J. Mooney, George Robinson, François J. Swanepoel, Carmichael Wilson, Leslie D. Dennard, Joseph Morris, John L. F. Steele, Otto G. Wilde, Eileen Braugan, Anthony B. Monks, Sylvia B. Wigoder, Gerrard A. Sloan, Simon Wigoder, Samuel McDermott, Mark J. Bradlaw, Samuel E. Magowen, Harry Ruben, Alexander L. Dobbyn, Kenneth F. Mackenzie, Richard L. G. Proctor, John H. Bowyer, James S. Armstrong, William A. Hopkins, Maurice D. Fox, Lionel S. Levitt, John N. Atkinson.

Midwifery (B.A.O.).—Thos. W. MacDowell (passed on high marks), John V. Morris, William Gallaugher, Wentworth A. Taylor, Thomas C. Foster, Robert V. Franklin, Richard T. Cronin, Annie T. Deane, Mary C. Livingston, William C. G. Potts, François J. Marais, Edward A. Bennet, William G. Maule, John St. Clair, Patrick Wallace, Harry Waters, William A. Hopkins, Oliver Chance, Edward C. Dudgeon, Robert H. McKeag, Gideon J. Joubert, Gerard A. A. Powell, Eric T. S. Rudd, Charles L. Taylor, Francis V. Duke, Caleb P. Wallace, David N. Power, Thomas G. B. Crawford, Margaret O'Neill, William O. Warrington, Edward S. A. Crawford, George F. Gillespie, Leslie D. Dennard.

tests are best done by the teacher, whom the children know and trust, rather than by the doctor, with whom they are apt to be shy. Children found wanting can be handed to the medical authority for more detailed examination. Deaf children could thus be discovered when treatment is of use and a large number of cases of deafness could thus be prevented. At present, these children go unrecognised, often until too late.

I may add that it is a matter of great gratification to me to find that the attention of otologists is becoming aroused to the necessity of prevention. I have been preaching it for the past 15 years, as has my friend Dr. Kerr Love in Scotland.

I am, Sir, yours faithfully,
MACLEOD YEARSLEY, F.R.C.S.
Wimpole-street, W., July 7th, 1924.

RESEARCHES ON LEPROSY AND THEIR BEARING ON THE TREATMENT OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—May I draw attention to a statement in Sir Leonard Rogers's lectures (THE LANCET, June 28th, p. 1297) in which he credits me with the statement that "the addition of 3 per cent. solutions of sodium gynocardate, morrhuate, or oleate to a pancreatic extract doubled the fat-splitting effect of the pancreatic lipase on an emulsion of olive oil." The accelerating action of sodium oleate on lipase varies considerably according to the percentage strength of the solutions used, and so far from using 3 per cent. strength solutions, 0·9 per cent. strength solutions were used in my experiments. My statement in the paper[1] referred to by Sir Leonard Rogers is "Systematic investigation of sodium oleate had previously shown that the accelerating action on extract of pancreas varies considerably according to the percentage strength of the solutions used; graduated amounts added to the extract show also a gradual rise in values up to a maximum, falling ultimately to nothing. I chose, therefore, a 0·9 per cent. solution of sodium oleate which had given good results formerly, and the same percentage solutions of sodium morrhuate and sodium gynocardate, using 1 and 2 c.cm. amounts of these solutions." Obviously the matter is of importance also in therapeutic dosage. He says further that these experiments in vitro led me to suggest a stimulating action of tissue lipolysis in part explanation of the therapeutic effect of sodium morrhuate and sodium gynocardate on acid-fast bacilli, and led him to investigate the possibility of these substances also stimulating the production of fat-splitting lipase in the blood of leprosy and tubercle cases, whereas, as a matter of fact, in my paper, after giving the actual results in my experiments *in vitro*, I went on to say that in view of the ascertained action of sodium oleate in vivo,[2] "it would seem reasonable to infer a direct stimulating action of tissue lipolysis in, at any rate, partial explanation of the therapeutic effect of sodium morrhuate and of sodium gynocardate, in addition to a direct destructive action claimed for both (Rogers) or for the chaulmoogrates alone (Walker and Sweeney) on acid-fast bacilli."

I am glad to see the confirmation of the lipase theory by Sir Leonard Rogers in the particular case of leprosy, which I have so long pointed out and maintained in cancer, tuberculosis, and other infectious diseases. I may, perhaps, be permitted to add that in 1912 I showed that in recovered tuberculosis the lipolytic activity of the serum is increased. Somewhat later it was found to be decreased in the acute stages, as well as (1914) in T.B. infected guinea-pigs and rabbits examined in the bacteriological laboratory, King's College. In my culture experiments also lipase killed tubercle bacilli.

I am, Sir, yours faithfully,
J. A. SHAW-MACKENZIE, M.D. Lond.
London, July 4th, 1924.

Obituary.

CHARLES HUNTER STEWART, D.Sc., M.B., C.M. EDIN.

BY the death of Dr. Charles Hunter Stewart, professor of public health and sanitary science and director of the John Usher Institute of Public Health, the University of Edinburgh has suffered another loss. Although he had been in poor health for some time, his death on June 30th at his residence in Melville-street, Edinburgh, came quite unexpectedly.

Prof. Stewart was born in Edinburgh in 1854, and educated at the University of his native city, while later he studied extensively on the continent. He first underwent training as a pharmaceutist, but, forsaking materia medica and chemical pharmacy, he applied himself with marked success to the study of experimental science and medicine, graduating Bachelor of Science in 1882, Bachelor of Medicine in 1884, and Doctor of Science in 1894. In 1880 he won the Hope Prize Scholarship in organic chemistry, and four years later the Mackay-Smith scholarship in chemistry. His early scientific training made him a keen observer and a most painstaking investigator. When in 1894 the University of Edinburgh decided to institute a public health laboratory in connexion with the chair of forensic medicine he was chosen by Sir Douglas Maclagan, then professor of medical jurisprudence, to organise and conduct the instruction in it. In 1898 he was appointed to the newly founded Bruce and John Usher Chair of Public Health, and he occupied that chair till his death. In 1902 he became also director of the Usher Institute of Public Health, to the planning and arranging of which he devoted a large amount of time and thought, the result being the provision of laboratories, which at that time were regarded as perhaps the finest in the country.

His colleague, Dr. J. Buchanan Young, writes: "In experiment Prof. Stewart was resourceful, and above all accurate, and he demanded the same accuracy in working from those whom he trained. As a young man he had worked hard, and he never failed to impress on his students the necessity for hard work if success was to be attained, and he took a keen interest in following the careers of those whom he had taught. His prolonged study in continental laboratories and his vast experience in laboratory work made him quick to appreciate improvements in processes and methods, but before any new methods were introduced into his courses of instruction they had to be thoroughly tested by himself as to accuracy of the results given. For many years he was well known and much sought after as an expert witness before the Scottish courts in river pollution cases, and in reference cases involving special knowledge of water-supply, &c. To the investigations connected with these he devoted a large amount of time and energy. The number of experiments he conducted, and the amount of labour and time he expended in satisfying himself as to the soundness of the views he expressed in evidence, were only known of by those who were associated with him in such work. His favourite reply when asked if it was absolutely necessary to make a certain experiment, which to the inquirer seemed somewhat troublesome, was 'Prove all things'! In later years he devoted himself largely to the epidemiological and statistical departments of public health. His grasp of figures was marvellous, and his memory for figures rather 'uncanny.' As a lecturer he was emphatic in style, interesting, and insistent on salient points. He had a quiet, somewhat 'pawky' humour, and those who met him in private life found in him a most interesting conversationalist, willing to discuss practically any subject. During 40 years as a teacher in the University (26 of these as professor of public health) he had seen many changes in the Edinburgh Medical School, and had taught a very large number of students. We who remain are all the poorer by his passing."

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[1] Med. Press and Circ., August 18th, 1920.
[2] Proc. Physiol. Soc., Jour. Physiol., xlii., p. 11.

ondon Hospital.—The prizes and certificates ed by students of the London Hospital Medical College Dental School (University of London) were distributed Ionday, June 30th, by Sir Arthur Keith, in the Library he College. Lieut.-Colonel W. Marlborough Pryor, rman of the College Board, presided. Prof. William ght, the Dean, in his report stated that although the s 1914–18 were years of great difficulty for the College, could now confidently say that the difficulties had surmounted and that the College was never in a more nising or indeed more flourishing condition than it was resent. Among the changes which had taken place in the ege the most important was the discontinuance of the hing of what were formerly the subjects of study during first year of the medical curriculum—namely, elementary nistry, physics, and biology. Their action in this respect been recently followed by the General Medical Council, had removed elementary chemistry and physics from medical curriculum and made them the subjects of a medical examination. The change had provided them increased accommodation for the teaching of the purely lical subjects, while funds had been released for improving teaching arrangements in connexion with, more particu-y, the clinical subjects. The appointment of, in addition the staff of the medical unit, no fewer than five surgical four medical whole-time assistants, selected from the est of their younger men, was a new departure in the anisation of clinical teaching and should, with the ivalled clinical facilities which existed at the London spital, ensure that in the spheres of clinical teaching l research they would more than maintain their already h position among the medical schools of the country. The stees of the late Sir William Dunn had recently presented hospital, at a cost of £8000, with a series of clinical oratories, which would be officially opened in a few days. e Worshipful Company of Goldsmiths had given £15,000 the endowment of the Goldsmiths' Chair of Bacteriology. e number of students in attendance compared favourably h that of former years. In the academic year now closing y stood, he believed, alone among the larger medical ools in London and throughout the country in being e to report an increased entry—an increase due largely to entry of men from Oxford and Cambridge.

After presenting the prizes and certificates to the successful dents Sir Arthur Keith said that to get a good reputation s the easiest thing in the world, and with that object rything they did must be unselfish. The unforgivable which would never be forgotten was that of selfishness, t of playing entirely for one's own hand. In aid of a good utation came absolute honesty of purpose, speaking as r the truth as they could when the occasion called for it. ey should not mislead their patients. No medical man s honest who was not familiar with what was happening the best medical circles, in the way of discovery and advance medicine. They could not be honest unless they continued be medical students all through their lives. It was necessary them to read constantly the medical papers. The rticular kind of unselfishness which appealed to him re than any other was that which led men to devote their rgies and their time to the discovery of fresh facts which de medicine a better-equipped tool in the hands of medical ctitioners.

The following students were awarded prizes and certifi-tes:—

Price University Scholarship in Anatomy and Physiology—l 10s.: Mr. H. L. Green (University of Cambridge); £26 5s.: V. H. Brink, proxime accessit (University of Oxford). nical Medicine—£20 prize: Mr. E. V. Suckling; Honorary tificates: Mr. W. H. George, Mr. G. Milne, and Mr. G. King. nical Surgery—£20 prize: Mr. G. Milne; Honorary certifi-e: Mr. R. H. Wooderson. Clinical Obstetrics and Gynæcology £20 prize: Miss M. I. Neal; Honorary certificate: Mr. W. Thomas. Andrew Clark Prize in Clinical Medicine and thology—Biennial—£26: Mr. G. King; Honorary certificate: H. G. Wyatt. Letheby prizes in—(a) Organic Chemistry—5: Mr. A. M. A. Moore; (b) Chemical Pathology—£10: r. H. N. Bradbrooke; Honorary certificates in Anatomy and ysiology: Mr. D. H. Smith, Mr. F. H. N. Cruchley, and Mr. F. Ward. [illegible] prizes—(Elementary Clinical Surgery) £5 prizes: Mr. F. L. White, Mr. F. W. Tabois, Mr. S. Levy mpson, and Mr. H. L. Green. Honorary certificates: Mr. A. Taylor, Mr. R. K. Debenham, and Mr. R. J. Vince. inor Surgery)—£5 prizes: Mr. F. S. Duck, Mr. G. C. Dorling, r. D. R. W. Burbury and Mr. G. A. Coggin (divided), and r. A. M. A. Moore. Honorary certificates: Mr. F. H. N. uchley, Mr. H. A. Eason, Mr. E. N. Callum, Mr. W. D. Williams, d Mr. C. Wall. Practical Anatomy—£1 4s. prize: Mr. L. son: £2 2s. prizes: Mr. W. D. Williams, Mr. A. F. Parker, d Mr. H. A. Eason. Anderson prizes in Elementary Clinical edicine—£5 prizes: Miss C. M. Hext and Mr. H. N. Bradbrooke. norary certificates: Mr. S. Howard, Mr. W. E. Parry, Mr. Morton, Miss L. G. Apps, Mr. V. H. Brink, Mr. A. C. Gairdner, r. H. M. Bates, Mr. J. H. Ripka, Mr. E. W. Hayward, and r. H. M. Lloyd. Arnold Thompson Prize in Diseases of Children £15 prize: Mr. G. Kin [illegible] orary certificate: Mr. W. A. [illegible] Harold [illegible] erative Dental Surgery— Mr. W. R. [illegible] Mr. M. Spelber (divided).

Honorary certificate: Mr. D. W. N. Squires. The London Prize in Dental Surgery and Pathology—£5 5s.: Mr. D. W. N. Squires. The London Prize in Dental Prosthetics—£5 5s.: Mr. O. N. Catchpole; Honorary certificate: Mr. I. Frankel. Class examination prizes (each of the value of £3 3s.)—Dental Surgery and Pathology: Mr. J. L. Gordon; Honorary certificate: Mr. B. J. Swyer. Dental Prosthetics: Mr. O. N. Catchpole; Honorary certificates: Mr. H. W. Duchesne, Mr. J. E. M. Hennessey, Mr. J. N. Noriskin, Mr. A. Schultz, Mr. A. Silva-Jones, and Mr. A. Bendelstein. Dental Metallurgy: Mr. J. W. Gilbert. Dental Histology (Normal): Mr. H. Middleburgh; Honorary certificate: Mr. G. R. Mears. Dental Anatomy: Mr. H. Middleburgh.

Society of Apothecaries of London.—On July 8th a dinner was given by the Society (in their hall) to representatives of the medical profession from the Dominions. The guests were received by the Master, Dr. Thomas Wakefield, and the Wardens, Dr. A. D. Brenchley and Dr. T. V. Dickinson. In proposing the toast of "Our Guests," Dr. Wakefield gave an interesting sketch of the history of the Society of Apothecaries from its foundation in the reign of James I. He compared the growth of the colonies at different periods of the Society's life, and said that he regarded this evening as one of the most important events in its whole history. Lieut.-Colonel Grant, I.M.S., replied for India and referred to the work of Sir Ronald Ross and Sir Leonard Rogers; Dr. T. J. Costello responded eloquently on behalf of Canada. Dr. T. Taylor Downie, speaking for Australia, said that their greatest drawback in that continent was lack of population, and referred to it as a land of splendid endeavour. For New Zealand Dr. Arnold Izard spoke, and for South Africa Dr. H. Temple Mursell. Newfoundland was represented by Dr. T. W. Grenfell, who said that he ought really to represent Labrador, and gave a vivid account of life and work in that country. Other speakers were Sir Bruce Bruce-Porter, vice-chairman of the Dominions Hospitality Committee, Dr. Gordon Brown, senior Past Master of the Society, Sir Ronald Ross, and Dr. A. L. Hoops. Among the guests were Sir William Hale-White, Dr. Herbert Spencer, Sir W. J. Collins, Mr. A. Mortimer Woolf, Mr. E. T. C. Milligan, Sir George Buchanan, Dr. A. J. S. Brandon, Dr. F. W. B. Greaves, Colonel E. C. Freeman, Dr. J. J. Holland, Dr. E. Fyffe, and Dr. W. F. Burfitt. At the conclusion of the evening an illustrated booklet descriptive of the Society's hall and of the "Art and Mistery" of the apothecaries was presented to each guest.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, July 15th.

SPECIAL GENERAL MEETING OF FELLOWS: at 5 P.M., to be immediately followed by a
GENERAL MEETING OF FELLOWS:
Ballot for election to the Fellowship.

LONDON DERMATOLOGICAL SOCIETY.
Wednesday, July 16th.—4.30 P.M., Annual General Meeting at St. John's Hospital, Leicester-square.
Clinical Cases and Pathological Specimens will be shown.
The Monthly Dinner of Fellows will not take place on this occasion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Monday, July 14th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Mr. Simson: Diseases of Women. 2 P.M., Mr. Bishop Harman: Eye Dept.
Tuesday.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
Wednesday.—11 A.M., Medical Registrar: Medical Wards. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients.
Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Medical Registrar: Clinical Methods. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
Friday.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.
Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.
Thursday, July 17th.—5 P.M., Mr. Richard Lake: Otosclerosis. (Geoffrey E. Duveen Lectures in Otology.)

HOSPITAL FOR SICK CHILDREN, Gt. Ormond-street, W.C.
Thursday, July 17th.—4 P.M., Dr. Pearson: Pyrexia of Obscure Origin.

Diploma in Public Health.

Part I., Chemistry, Bacteriology, Physics, and Meteorology.—Alice M. A. Downing, William E. Hutchinson, and Edward Parker.

Part II., Sanitary Engineering; Practical Sanitary Report; Hygiene and Epidemiology; Vital Statistics and Public Health Law.—Benjamin W. D. Fayle, William E. Hutchinson, Alice M.A. Downing, Robert S. McElroy, Alfred E. Campbell, Mary M. Galvin, Ruth Lemon, Ninian McI. Falkiner, and Iris P. Nelis.

Diploma in Gynæcology and Obstetrics.

Sylvia Gytha de Lancey Chapman.

Royal College of Physicians of London.—An extraordinary Comitia was held on July 3rd, Sir Humphry Rolleston, the President, occupying the chair. A report was received from the Treasurer on the Commemoration of the Tercentenary of the death of Thomas Sydenham at the Académie de Médecine de Paris, held on May 20th last. The quarterly report of the College Finance Committee was received and adopted. Prof. A. J. Hall was reappointed a representative of the College on the Court of Governors of the University of Sheffield.

Royal College of Surgeons of England.—The annual meeting of the Fellows of the College was held at 10 A.M. on July 3rd for the election of three Fellows into the Council, in the vacancies caused by the retirement in rotation of Mr. W. E. Haslam, Mr. T. H. Openshaw, and Mr. Raymond Johnson. The President of the College, Sir John Bland-Sutton, was in the chair. The voting was carried out mainly by post, as has been the custom for many years, 1140 voting-papers being thus received from all parts of the world, while eight Fellows voted in person. There were 11 candidates for the three vacancies, and as the result of the ballot the President declared the following Fellows to be elected: William McAdam Eccles with 463 votes, Wilfred Trotter with 371 votes, and Sir Charles Gordon-Watson with 359 votes.

In the afternoon of the same day a reception was held by the President and the Council in the museum of the College, when the annual exhibitions of additions to the museum was opened for inspection between 4 and 6 P.M. Many specimens of surgical, pathological, and anthropological interest were on show, and of the additions to the museum some account was given in The Lancet of last week (p. 28). The guests were received by the President and Lady Bland-Sutton, and for the first time in the history of the College, ladies were amongst those invited. Mr. H. J. Waring, Vice-President of the College, was also receiving; Sir Berkeley Moynihan, Vice-President, was unavoidably absent. The guests included all the members of the Council of the Royal College of Surgeons and ladies, Lord and Lady Riddell, Sir Rickman and Lady Godlee, Mr. and Mrs. Stanley Baldwin, Lord and Lady Aberconway, Sir Edward and Lady Boyle, Sir George and Lady Frampton, Lady Evans, Mr. and Mrs. Massey-Lyon, Colonel A. Sankey, and Mr. and Mrs. Gwynne. A programme of music was given by the Keith Prowse orchestra, and refreshments were served in the Inner Hall.

Beit Memorial Fellowship.—At a recent meeting of the trustees of the Beit Memorial Fellowship for Medical Research, Sir James K. Fowler, the hon. secretary, presented the annual report. The report stated that as far as the trust was concerned, the work of research had been carried on during the past year by one Senior Fellow, one fourth year Fellow, and 20 Junior Fellows, and the reports of the directors of the laboratories in which they were engaged indicated that in all cases their work had been satisfactory, and in many cases contained the statement that valuable additions to science might result from the researches upon which they were engaged. The Advisory Board have recommended that all the Junior Fellowships which do not now expire should be renewed for a further period of one year. Each year of late, Sir James Fowler said, as the number of candidates whom it was possible to exclude by a preliminary examination has diminished, the task of selection has become more difficult, and it can be stated that on this occasion every candidate gave evidence of being either actually engaged in scientific work or of capacity to undertake it. Eighty-six applications for forms and information were received in response to the advertisements announcing the election now to be held. Two of the Junior Fellows, Dr. Robert K. Cannan and Miss Ethel M. Luce, who had applied for an extension of their Fellowship to a fourth year, had withdrawn their applications owing to their appointment to Rockefeller Travelling Scholarships, as both Fellowships could not be held at the same time. This arrangement had the advantage of enabling such of the Beit Fellows as had shown exceptional capacity for research to obtain the great advantage of working for a time in laboratories in the United States, and did not prevent them from subsequently holding a Senior Fellowship on the Beit Foundation. Dr. Thomas Renton Elliott was appointed assistant hon. secretary. H. Davenport Kay, a Junior Fellow, was appointed to a Fourth Year Fellowship. The following are the names of the candidates elected to Junior Fellowships with an indication of the direction of research or proposed research. Alan Sterling Parkes, Ph.D., the physiology of reproduction. Henry Cohen, (1) continuation of work on composition of cerebrospinal fluid; (2) practical application of the "meningitis law."; (3) rate and cause of disappearance of glucose in the G.C.S.F. in meningitis; (4) effect of alterations in the chemistry of the blood or the permeability of the choroid plexus. Honor Bridget Fell, B.Sc., (1) experimental study of the nature of tumour growth. Margaret Averil Boas, B.Sc., action of anti-rachitic vitamin in diet and of light radiation in promoting retention of calcium and phosphorus. Henry Francis Holden, M.A., study of optically active substances, other than glucose, in normal and diabetic protein-free blood filtrates.

Rockefeller Medical Fellowships.—The Medical Research Council announce that they have awarded Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1924–25, to the following: Robert Keith Cannan, M.Sc. Lond., Senior Assistant in Biochemistry, University College, London; John Josias Conybeare, D.M. Oxf., M.R.C.P. Lond., Assistant Physician and Warden of the College at Guy's Hospital, London; James Rögnvald Learmonth, M.B., Ch.B.Glasg., Assistant to the Professor of Surgery, Anderson College of Medicine, Glasgow; Ethel Marjory Luce, M.D. T.C. Dub., Lister Institute of Preventive Medicine, London; John William McNee, D.S.O., D.Sc., M.D.Glasg., M.R.C.P. Lond., Senior Assistant in the Medical Unit, University College Hospital, London; William Robson, B.Sc. Lond., Chemical Assistant in the Department of Therapeutics, University of Edinburgh.

Society of Medical Officers of Health.—Owing to the illness of Dr. T. W. Naylor Barlow, the annual provincial meeting of this society will not be held at Wallasey on July 14th as arranged. A short business meeting to deal with matters on the agenda for the annual provincial meeting will be held at 2.30 P.M., on July 18th, at the University of Liverpool.

Medical Women's International Association.—A meeting of this Association will be held in London from July 14th to 21st, at the invitation of the British Medical Women's Federation. On July 15th and 16th council and general meetings of the Association will be held, and on July 17th a discussion on Maternal Morbidity will take place. Various hospitals will be visited in London and Brighton. The social arrangements include a reception on the evening of July 16th at 10, Downing-street, by the Prime Minister, who, with other Members of Parliament, will also entertain members to tea at the House of Commons the following afternoon. A dinner, by invitation of the British Medical Women's Federation, will be held at the Trocadero Restaurant, London, W., on July 17th. Further particulars of the Congress can be obtained from the hon. secretary of the Hospitality Committee, Dr. K. F. Lander, 49, Albany-street, London, N.W. 1.

London Ambulance Service.—In a report presented to the London County Council by the Fire Brigade Committee, attention is drawn to a suggestion made in the recent report of the Ambulance Cases Disposal Committee, which was not included in the Committee's final recommendations. About 14 per cent. of the total number of cases dealt with by the ambulance service in the year 1922–23 were in respect of the removal of patients from one institution to another after the administration of emergency treatment. This arrangement involves the withdrawal of ambulances from the more pressing service of attending upon street accidents, and the Ambulance Committee suggested that a simpler and less costly type of ambulance might be used for this subsidiary purpose. The Fire Brigade Committee state that they have under consideration the practicability of this suggestion, although they hope that, if effect be given to the recommendations of the Ambulance Committee, the necessity for such transfers will be considerably lessened, if not entirely dispensed with. The London County Council this week passed a resolution to the effect that no institution which is not equipped for the reception and treatment of serious cases of accident or illness be retained on the list of institutions to which ambulance cases shall, in the first instance, be taken, that a list of such institutions be prepared, and that the coöperation of the Ministry of Health be sought in the case of infirmaries, and of King Edward's Hospital Fund in the case of hospitals. This resolution embodies the substance of two of the recommendations of the Ambulance Committee. The Fire Brigade Committee will settle the list.

Expenditure on Vaccination.

Mr. BLACK asked the Minister of Health whether he could supply details of the expenditure on vaccination for the year 1921–22, stated to amount to £172,558: and how many infants were actually vaccinated for this sum, and what the cost per infant vaccinated had been.—Mr. WHEATLEY replied: The sum of £172,558 included £10.158 paid to public vaccinators out of the Exchequer contribution accounts of the local authorities and £162,400 expended by boards of guardians out of the rates, but I am unable to supply any further details. The number of infants vaccinated by public vaccinators during the year ended Sept. 30th, 1922, was 205,106. It is not possible to state the cost per infant vaccinated, as the expenditure on public vaccination includes also the cost of other vaccinations and revaccinations, and the necessary administrative expenditure under the Vaccination Acts.

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The DUCHESS of ATHOLL asked the Secretary for Scotland whether, in view of the numerous serious cases of child assault occurring in Scotland, he would set up a committee of inquiry to inquire into the extent of this evil and to suggest how it might be remedied.—Mr. STEWART (Under-Secretary for Health for Scotland) replied: My right hon. friend is not satisfied that the circumstances in Scotland are such as to justify the expectation that an inquiry of the nature indicated in the question would serve a useful purpose. If, however, the noble lady will favour him with a statement of the grounds on which her suggestion is based, he is prepared to give the matter further consideration.

THURSDAY, JULY 3RD.

Tuberculous Persons in Sanatoriums.

Mr. ROBERT MORRISON asked the Minister of Health whether he has any information as to the number of tuberculous persons at present in sanatoriums and the number awaiting admission.—Mr. WHEATLEY replied: The number of persons receiving treatment in residential institutions under the tuberculosis schemes of local authorities in England and Wales on June 1st last was 18,245 and the number of persons recommended for and awaiting such treatment on that date was 4150. I am hopeful that the circular issued by my department in February last promising grants in aid of approved proposals for the development of the health services will result in a substantial addition to the available accommodation for the treatment of this disease.

Criminal Statistics for 1922.

Mrs. WINTRINGHAM asked the Home Secretary if he would give information as to the date when the publication of the criminal statistics for 1922 might be expected in view of the lapse of time since the report for 1921 was issued; and whether copies of the criminal statistics would be circulated officially to all benches of magistrates in addition to the circulation of official copies to all police authorities.—Mr. HENDERSON replied: It is hoped that the volume will be issued early next month. Copies are supplied officially to all superior criminal courts, including recorders and chairmen of quarter sessions, but I am afraid it is not possible to make a free issue to all benches of magistrates.

TUESDAY, JULY 8TH.

Notified Diseases.

In reply to a question how many cases of the following diseases have been notified this year—small-pox, diphtheria, scarlet fever, pneumonia, enteric fever, encephalitis lethargica, Mr. WHEATLEY (Minister of Health) replied: The numbers of cases of these diseases notified (uncorrected figures) during the 26 weeks ended June 28th, 1924, are as follows: Small-pox, 2196; diphtheria, 18,095; scarlet fever, 36,910; pneumonia, 41,321; enteric fever, 1683; encephalitis lethargica, 3620.

Sickness Benefit Delays.

Mr. SAMUEL ROBERTS asked the Minister of Health whether he was aware of complaints arising from delay in payment of sickness benefit under the National Health Insurance Act to sick insured persons; and, if so, whether he would appoint a departmental committee to inquire into the matter.—Mr. GREENWOOD (Parliamentary Secretary to the Minister of Health) replied: My right hon. friend is aware that complaints are occasionally made of delay in the payment of benefit to which insured persons are entitled. The subject has been and is being dealt with departmentally and he does not think it necessary to appoint a departmental committee, particularly in view of the appointment of a Royal Commission to review the whole system of national health insurance.

Free Use of Public Baths.

Mr. AYLES asked the Minister of Health whether, in view of the serious difficulty arising out of the overcrowding of the people in the large towns, he could see his way to advise local authorities that if in their opinion it was necessary to public health for unemployed persons and their dependents to have the free use of the public baths in their areas, he was prepared favourably to consider grants in aid for that purpose.—Mr. GREENWOOD replied: My right hon. friend regrets that he has no funds available for this purpose.

Coöperation in Town Planning.

Mr. AYLES asked the Minister of Health how many areas had passed the necessary resolutions preliminary to making town plans for their area; and whether he would see that the closest coöperation was advised between town planning, housing, and sanitary and improvement committees in order to avoid conflicting policies and overlapping in the alteration of developed areas and the layout of new ones.—Mr. GREENWOOD replied: Resolutions have been passed by 229 local authorities. My department are constantly emphasising the importance of the closest coöperation not only between different committees of the local authority but also with outside interests.

Inquiry into Final Awards.

Lord HENRY CAVENDISH-BENTINCK asked the Minister of Pensions if he had received a resolution from the Nottingham and district war pensions committee, in which they urged him to review the whole system of final awards, on the grounds that the present system involved undue hardship and even injustice in many cases; and whether, in view of the number of unsuccessful appeals and the dissatisfaction existing among the appellants at their treatment, he would cause the whole system to be inquired into.—Mr. J. W. MUIR replied: My right hon. friend has not yet received the resolution referred to. I may, however, remind the noble lord that my right hon. friend has, as indicated in his reply to the hon. and gallant Member for East Rhondda on March 27th last, put in operation arrangements which will enable cases in which an award is found to have been erroneously declared final to be amended.

Medical Examination and Home Treatment.

Mr. GROVES asked the Minister of Pensions whether he had considered the effect upon ex-Service men of Circular M.P.A.O. 15A, home treatment, which in cases where, as a result of medical examination by the Ministry doctors, treatment by a general practitioner was necessary, advised consultation with the national health insurance doctor on whose panel the man was listed, but also stated that the man would not be prevented from working at a remunerative occupation in consequence of and during treatment allowance therefore not being payable; whether he was aware of the cases where the panel doctors thus concerned, after careful examination, had issued certificates definitely stating that they found the man incapable of work, but the Ministry of Pensions had refused to honour such certificate; and whether, when such decision was given for disabilities which the Ministry agreed as being due to or aggravated by war service, he would give instructions to local area offices that certificates granted by the national health insurance doctor, to whom the man was specially referred, were acceptable and full treatment allowances be granted for the periods of incapacity covered.—Mr. J. W. MUIR replied: The conditions governing the grant of allowances under Article 6 of the warrant are not identical with those which determine certification for the purpose of sickness benefit under the National Health Insurance Acts. My right hon. friend regrets, therefore, that he is unable to adopt the suggestion in the last part of the question. At the same time, the circular letter referred to does not appear to my right hon. friend to be altogether satisfactory, and it will be reconsidered.

MEAT INSPECTION IN SCOTLAND.—The Scottish Board of Health have issued to all local authorities in Scotland revised regulations, which come into force on August 1st, dealing with the inspection of meat and kindred matters. The object of the regulations is to protect consumers from diseased or unsound meat. In a covering circular the Board explain that the new regulations (the official title of which is "The Public Health (Meat) Regulations (Scotland), 1924") cover practically the same scope as the Meat Inspection Regulations issued in April, 1923, with some adjustments designed to improve the machinery of administration and with some additions. Among the matters the machinery for dealing with which has been adjusted are the inspection of the carcasses of animals slaughtered because of accident or for other emergency reasons, and the hawking of meat and meat-food products from carts or other vehicles or from barrows, baskets, booths or stances, and among the new provisions is one prohibiting the hanging of carcasses intended for purposes of food in stables and similar places, the carrying on of a butcher's business in premises used as living accommodation, and the storing of meat intended for sale in living and sleeping rooms. Copies of the regulations can be obtained from H.M. Stationery Office, 120, George-st., Edinburgh, price 4d.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JULY 8TH.

Liquor (Popular Control) Bill.

THE debate was concluded on Lord Banbury's motion for the rejection of the Bishop of Oxford's Liquor (Popular Control) Bill.

The motion for rejection was carried by 166 votes to 50, majority 116.

HOUSE OF COMMONS.

WEDNESDAY, JULY 2ND.

Legacies to Hospitals.

THE Finance Bill was considered in Committee, Mr. YOUNG, Chairman of Committees, in the chair.

Viscount EDNAM moved a new clause to provide that legacy and succession duty should not be leviable on testamentary bequests made to hospitals carried on in the public interest. He said that the dividends on bequests and legacies were the only regular source of income on which the hospitals could rely. The cost of the concession, it was calculated, would be between £80,000 and £130,000 a year.

Lieut.-Colonel FREMANTLE said that hospitals were an absolute necessity of modern civilisation, and if charitable efforts were to fail there was not the least question that there would be an overwhelming demand that the hospitals should be maintained and extended out of the rates and taxes.

Sir C. BARRIE, speaking as the past chairman of one of the largest hospitals in Scotland, supported the appeal, and said that it would be lamentable if the country were to allow its hospitals to be put on the rates or kept up by money provided by the State.

Mr. SNOWDEN, Chancellor of the Exchequer, said that if they were discussing this question as a sentimental matter they would be all agreed; but they must not allow their sentiments to blind them to reasonable arguments. This proposal really amounted to a State subsidy to the voluntary hospitals and the money would be handed over without any control as to the spending of it. Moreover, if the concession were granted, the case would be irresistible for its extension to other charities. He was not going to say that it was inadvisable that the State should make a contribution to the voluntary hospitals, but if that were done this was not a desirable way of doing it. If legacies to hospitals were freed from duty he did not think that the hospitals would gain very much and the State would lose about £200,000 a year. He was therefore compelled to resist the amendment.

On a division the proposed new clause was negatived by 251 votes to 148, majority against 103.

Ratio of Births and Deaths in Great Britain.

Mr. BLACK asked the Minister of Health whether he would state the extreme variations of the rates of births and deaths in the various localities in Great Britain, and also the average rate of births and deaths for the whole country during the past year.—Mr. WHEATLEY replied: In England and Wales during 1923 the birth- and death-rates per 1000 population ranged in various types of administrative area, are as follows:—

	Births from—	Deaths from—
Urban areas—		
50,000 population and over ..	13·0 to 27·5 ..	9·0 to 16·3
20,000 to 50,000 population ..	11·0 to 31·4 ..	7·2 to 16·5
Under 20,000 (ignoring populations of less than 1000) . ..	7·2 to 35·4 ..	4·8 to 20·5
Rural areas—		
Ignoring populations of less than 1000	9·8 to 34·7 ..	7·0 to 19·7

The average rates for England and Wales are: Births, 19·7; deaths, 11·6. As regards the figures for Scotland, the hon. Member will no doubt address a question to the Secretary for Scotland.

Officers' Disability Retired Pay.

Sir BERTRAM FALLE asked the Parliamentary Secretary to the Admiralty whether he was aware that disabled officers who retired under the special terms laid down in A.F.O. 1358/1922 were not considered by the Ministry of Pensions to be eligible for disablement pensions, on the ground that they had received special treatment by the Admiralty; and whether the 5½ per cent. reduction in retired pay would be applicable to these officers.—Mr. HODGES replied: I am aware that the Ministry of Pensions does not regard officers retired upon the special terms granted in 1922 for the purpose of clearing the lists as eligible for disability retired pay under its regulations. As regards the second part of the question, the special rates of retired pay sanctioned in 1922 are subject to the 5½ per cent. reduction except in certain cases of young officers who were given the right to commute the whole of their retired pay.

Final Awards of Ex-Service Men.

Mr. WILLIAM ALBERT JENKINS asked the Minister of Pensions if he was aware that certain concessions had recently been made with regard to the final awards of ex-Service men; and, as a large number of ex-Service men were, on account of technicalities, experiencing much difficulty in getting their cases properly inquired into and were suffering injustice, would he take steps to repeal the Final Awards Act.—Mr. J. W. MUIR (Parliamentary Secretary to the Ministry of Pensions) replied: General instructions providing for an improved procedure for the correction of awards which are found to have been erroneously declared final have only been issued within the last few weeks, and further experience is, in the opinion of my right hon. friend, necessary before it can be determined that any modification of them is required.

Uniform Standard of Health Services.

Mr. BLACK asked the Minister of Health whether he would set up a committee to inquire into the necessity for, and the advantages of establishing, a minimum standard in the administration of all health services included in his Ministry in order to secure that the health interests of the public should be conserved in areas where the local authorities might not be progressive; and whether he would include expert medical officers of health upon such a committee.—Mr. WHEATLEY replied: As at present advised, I do not think the appointment of such a committee would be of advantage.

Royal Commission on Lunacy.

Mr. COSTELLO asked the Minister of Health if he would say whether the terms of reference to the Royal Commission on Lunacy included an inquiry into the conditions which obtain in mental institutions of every kind and the present régime to which the inmates were subject; and whether provision would be made for defraying the expenses incurred by witnesses in coming and staying in London to attend the sittings of the Commission.—Mr. WHEATLEY replied: The terms of reference of the Royal Commission include an inquiry into the certification, detention, and care of persons under the Lunacy Acts whether in public or private institutions or in single care. Witnesses summoned by the Commission to give evidence before them in London will be repaid their expenses in accordance with the scale prescribed by the Treasury.

Poplar Report on Food Adulteration.

Mr. LINFIELD asked the Minister of Health whether his attention had been called to the report on food adulteration by Mr. A. E. Parkes, the borough analyst for Poplar; and whether he could hasten the report of the Government Committee so that early action might be taken.—Mr. WHEATLEY replied: Yes, Sir, my attention has been called to the Poplar borough analyst's report. I understand that the Committee hope to present their report in the near future.

Overcrowding in Shoreditch.

Mr. THURTLE asked the Minister of Health whether he was aware of the fact that there were dwelling-houses in Essex-street, Shoreditch, in which the average number of occupants per room exceeded five; and if, in view of the moral and social consequences of such overcrowding, he was prepared to take power to acquire some of the large number of empty houses in the Sloane-square neighbourhood in order to provide better accommodation for the people.—Mr. WHEATLEY replied: I am aware of the overcrowded conditions in Central London. Local authorities have power to acquire and adapt large empty houses, but experience has shown that this is not usually the most economical means of providing fresh accommodation. I am satisfied that the best remedy for overcrowding is the building of new houses.

Housing Bill and Larger Houses.

Mr. TREVELYAN THOMSON asked the Minister of Health if he was aware that since the introduction of his Housing Bill the representatives of over 300 local authorities, representing the chief cities and towns in the country, assembled in conferences at Newcastle-on-Tyne, Manchester, Sheffield, London, Bristol, and Cardiff, had in all cases unanimously passed resolutions protesting against the subsidy being limited to the small type of houses named in his Bill; and, in view of this unanimous feeling in favour of a larger house, would he take powers which would enable him to grant the subsidy to houses of an additional 100 superficial feet on the recommendation of the local authorities concerned.—Mr. WHEATLEY replied: I cannot accept the suggestion that local authorities are unanimously in favour of an extension of the subsidy to larger houses, and I do not propose to ask the House to review the decision which it has already taken in regard to the size of the houses.

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Appointments.

BROWN, L. G., M.D., B.Ch. Oxf., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Ear, Nose, and Throat Department of Charing Cross Hospital.

GILCHRIST, J., M.D. Edin., one of the Medical Referees under the Workmen's Compensation Act for the county of Lanark.

M'KIE, W., M.B., Ch.B. Edin., Senior Resident Medical Officer at King's Cross Hospital, Dundee.

Certifying Surgeons under the Factory and Workshop Acts: VERITY, R. J. S., L.M.S.S.A. (Abersychan, Monmouth); WALKER, J. B., L.R.C.P. & S. Edin. (Ayr).

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—S.

Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.

Brighton, New Sussex Hospital.—Hon. Asst. Anæsth.

Chesterfield and North Derbyshire Royal Hospital.—R.S.O. £300.

Delhi, Lady Hardinge Medical College.—Lecturer in Physiology. Rs.750 p.m.

East Ham County Borough.—Temp. Asst. M.O.H. £500.

Gloucestershire Royal Infirmary. Gloucester.—P.

Hampstead General Hospital.—Gynæcologist.

Hong-Kong University, Faculty of Medicine.—Professor of Obstetrics and Gynæcology. £800.

Hospital for Consumption, &c., Brompton.—R.M.O. £500.

Hull City Mental Hospital.—Sen. Asst. M.O., &c. £600.

Hull Royal Infirmary.—Asst. House Phys. £130.

Isle of Wight County Mental Hospital.—A.M.O. £300.

King's Lynn, West Norfolk Hospital.—Res. Surg. O. £300–£350.

Kingston Union.—Second A.R.M.O. £300.

Larbert, Stirling District Mental Hospital.—Pathologist. £600.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Liverpool City.—M.O.H. £1800.

London Hospital.—Asst. Phys. Also Second Reg. to Ear, Nose, and Throat Dept.

Lymington, Hants, Borough.—M.O.H. £70.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—H.S. £50.

Margate, Royal Sea Bathing Hospital.—H.S. £200.

Metropolitan Hospital, Kingsland-road, E.—Asst. Dent. S.

Norwich, Norfolk and Norwich Hospital.—Anæsth. £300.

Oldham County Borough—Asst. M.O.H. £450.

Queen's Hospital for Children, Hackney, E.—Asst. Cas. H.S. £100.

Royal Chest Hospital, City-road, E.C.—P. to Out-patients.

Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and H.S.

Seamen's Hospital Society.—Surgeon.

Sheffield Royal Infirmary.—Med. Reg. £400. Also Ophthalmic H.S. £60.

Sutton, Sutton Downs Hospital for Children.—Jun. Asst. M.O. £500.

University College Hospital, Gower-street, W.C.—Tub. O. £300. Also Non.-Res. House Anæsth. £100.

Ventnor, Royal National Hospital for Consumption, &c.—Sen. Res. M.O. £300.

West London Hospital, Hammersmith-road, W.—Asst. Anæsth.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Hertford, Herts.

Births, Marriages, and Deaths.

BIRTHS.

DAVIES.—On July 4th, at "Plas-Darland," Wrexham, the wife of John E. H. Davies, D.S.O., M.R.C.S., L.R.C.P., of a son.

VAILE.—On July 2nd, at Albert-mansions, Northumberland-street, W., the wife of Dr. T. B. Vaile, of a son.

MARRIAGES.

FARDON—KIRKLAND.—On June 28th, at St. Mark's, Reigate, Harold Joseph Fardon, M.D., to Kathleen Nina, elder daughter of the late Arthur Kirkland, and of Mrs. Kirkland, of South Park, Reigate.

ROSS—TOWNSEND.—On July 5th, at St. Bartholomew-the-Great, London, James Paterson Ross, F.R.C.S., to Marjorie Burton, younger daughter of Captain F. W. Townsend Botley, Hants.

DEATHS.

ELLIOTT.—On July 4th, at Sonning-on-Thames, Edgar Elliott, M.R.C.S., L.R.C.P., late of Sevenoaks, in his 68th year.

NALL.—On June 29th, suddenly, at Furness Vale, Samuel Nall, B.A., M.B., D.P.H., M.R.C.S. Eng. (Camb. and St. Bart.), the beloved husband of Lizzie Nall, aged 69. For many years in practice at Disley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE PART PLAYED BY TRAINING COLONIES IN THE TREATMENT OF TUBERCULOSIS.*

BY F. N. KAY MENZIES, M.D. EDIN., F.R.C.P. EDIN., D.P.H.

THE first reference I can find to the "colony" is a plea by Sir Robert Philip, founded on the experience of the Royal Victoria Hospital, Edinburgh, for the establishment of farm colonies for tuberculous patients. The experience of that sanatorium showed (*a*) that in a number of cases complete arrest of disease could not be attained within the ordinary time-limit of sanatorium residence, and (*b*) that work of a definite character, far from impeding cure, assisted it. The farm colony then, as it was originally called, was a natural evolution of the sanatorium. Its purpose was to serve those tuberculous persons whose disease had been almost completely arrested, but who were found to remain liable to relapse when they returned to their ordinary avocations.

The original conception, therefore, was that with the patient still under medical supervision, his daily life should gradually approximate to the conditions of the ordinary working man's daily existence. The number of hours and the kind of work upon which each patient was engaged were regulated from day to day by the medical superintendent. In addition, some of the colonists, for whom return to their former occupation would mean certain recurrence of their disease, were trained in new pursuits and for them a *definite and suitable post was found before discharge from the colony.* Finally, the continued treatment and training, provided by the original farm colony, was carried out at remarkably low cost. The results were most encouraging and quite a large percentage of the colonists returned to their old occupations and remained well.

Such considerations led to the inclusion of the farm colony in the model tuberculosis scheme adopted by the Departmental Committee on Tuberculosis (1912–13). The problem of the tuberculous ex-Service man and his re-introduction into employment has played the principal part in the development of the colony idea.

We have also to thank the Inter-Departmental Committee (1919), presided over by Sir Montague Barlow, and the work of Dr. P. C. Varrier-Jones, for more recent developments. The report of that Committee stated as to training colonies (*a*) that they were only intended to provide a limited period *of training, usually 6 to 12 months*; (*b*) *that the colonists* were to be subjected to medical control and supervision; and (*c*) that they were only intended to form a stage in the treatment of the patient on the way to ordinary conditions *of life or to more permanent* settlements. The report quite reasonably attached immense importance to the *provision of permanent employment and settlement* under healthy conditions, and, therefore, the Committee made the permanent village settlement their chief recommendation. Shortly afterwards the Ministries of Health and Pensions issued various circulars and memoranda on the subject of vocational training colonies.

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To have had any chance of real success the following conditions were essential: (*a*) a more prolonged period of treatment and training; (*b*) a first-rate organisation for securing to the trainees a suitable occupation before leaving; (*c*) an equally first-rate business organisation for marketing their products. Had those essential conditions of success been provided, the outlook to-day might have been very different.

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Apart from these fundamental errors, the criticism may be justly made that training rather than treatment appears to be made the paramount consideration, and to make matters worse, the complete absence of any organisation for the provision of a suitable post for every colonist before leaving has been a disastrous oversight.

I plead, therefore, for an immediate realisation and frank recognition of these facts and a return to the sound conceptions upon which the original idea of the colony was based—namely, that the colony is an expansion of the sanatorium for patients for whom extended treatment is necessary. Broadly speaking, the colony at Burrow Hill has realised in considerable degree the aims and objects to which I have referred. Its success, however, would have been enhanced had it been possible to limit admission more rigidly to patients at stages in the disease likely to benefit from the opportunities afforded and it has also suffered from lack of an efficient system of care organisation.

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CARE OF THE FEEBLE-MINDED.

THE annual meeting of the Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble-Minded was held in the Manchester Town Hall on June 26th. Miss Dendy, its foundress and President, late Commissioner of the Board of Control, occupied the chair in the absence of the Lady Mayoress. The annual report submitted for adoption showed that the 296 places in the Sandlebridge Colony, conducted by the Society, are fully occupied. A new house is in process of building and has been approved by the Board of Control for 25 more patients. The applications for places by public authorities have always been very largely in excess of the number which can be received, thus showing, as has been frequently shown in previous reports, the great lack of residential school provision throughout the country for feeble-minded children. It is the great feature of Sandlebridge that life provision is made for all children received. The report stated that the occupations followed by the women and older girls—housework, laundry work, sewing, and knitting—showed satisfactory progress, and everyone had the pleasure of knowing that her share in the work, if it was only turning the mangle, or picking bits off the mats, or setting the table, had been of use in the daily life of the institution. The girls took great interest in the folk-dancing. In the workshops for the men and older boys boot-making, tailoring, mat-making, brush-making, and weaving was carried on. In submitting the report for adoption, Miss Dendy said that it had become more and more evident that segregation was the only method of dealing with the feeble-minded which was effective as well as proper to be used; there was a growing tendency brought about by the vastness of the problem to think that docile and harmless youths and girls might be dealt with by supervision in their own homes. Docile such patients might be, but nothing could prevent their being potentially dangerous. They were almost sure to become parents either with or without marriage. The speaker continued: "We have under our care two generations of one family, and we have over 200 adults who have been with us since childhood. Had they not been with us how many more to care for would there have been? Eight hundred is a low estimate. Having these children young, they become accustomed to their life and segregation is not the burden to them that it undoubtedly is to many who are cared for only when they have become, at large, an intolerable nuisance. And all of these adults would have been unemployed." The governing body of the Society were re-elected for the coming year and the meeting closed with a vote of thanks to Miss Dendy for her address.

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A little over a year ago a small training home for feeble-minded girls at Fairwarp, near Uckfield, was established by the aid of the East Grinstead Case Committee of the East Sussex Voluntary Association for Mental Welfare. The

Appointments.

Brown, L. G., M.D., B.Ch. Oxf., F.R.C.S. Eng., has been appointed Assistant Surgeon to the Ear, Nose, and Throat Department of Charing Cross Hospital.

Gilchrist, J., M.D. Edin., one of the Medical Referees under the Workmen's Compensation Act for the county of Lanark.

M'Kie, W., M.B., Ch.B. Edin., Senior Resident Medical Officer at King's Cross Hospital, Dundee.

Certifying Surgeons under the Factory and Workshop Acts: **Verity, R. J. S.**, L.M.S.S.A. (Abersychan, Monmouth); **Walker, J. B.**, L.R.C.P. & S. Edin. (Ayr).

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—S.
Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.
Brighton, New Sussex Hospital.—Hon. Asst. Anæsth.
Chesterfield and North Derbyshire Royal Hospital.—R.S.O. £300.
Delhi, Lady Hardinge Medical College.—Lecturer in Physiology. Rs.750 p.m.
East Ham County Borough.—Temp. Asst. M.O.H. £500.
Gloucestershire Royal Infirmary, Gloucester.—P.
Hampstead General Hospital.—Gynæcologist.
Hong-Kong University, Faculty of Medicine.—Professor of Obstetrics and Gynæcology. £800.
Hospital for Consumption, &c., Brompton.—R.M.O. £500.
Hull City Mental Hospital.—Sen. Asst. M.O., &c. £600.
Hull Royal Infirmary.—Asst. House Phys. £130.
Isle of Wight County Mental Hospital.—A.M.O. £300.
King's Lynn, West Norfolk Hospital.—Res. Surg. O. £300–£350.
Kingston Union.—Second A.R.M.O. £300.
Larbert, Stirling District Mental Hospital.—Pathologist. £600.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
Liverpool City.—M.O.H. £1800.
London Hospital.—Asst. Phys. Also Second Reg. to Ear, Nose, and Throat Dept.
Lymington, Hants, Borough.—M.O.H. £70.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—H.S. £50.
Margate, Royal Sea Bathing Hospital.—H.S. £200.
Metropolitan Hospital, Kingsland-road, E.—Asst. Dent. S.
Norwich, Norfolk and Norwich Hospital.—Anæsth. £300.
Oldham County Borough—Asst. M.O.H. £450.
Queen's Hospital for Children, Hackney, E.—Asst. Cas. H.S. £100.
Royal Chest Hospital, City-road, E.C.—P. to Out-patients.
Royal Free Hospital, Gray's Inn-road, W.C.—H.P. and H.S.
Seamen's Hospital Society.—Surgeon.
Sheffield Royal Infirmary.—Med. Reg. £400. Also Ophthalmic H.S. £60.
Sutton, Sutton Downs Hospital for Children.—Jun. Asst. M.O. £500.
University College Hospital, Gower-street, W.C.—Tub. O. £300. Also Non.-Res. House Anæsth. £100.
Ventnor, Royal National Hospital for Consumption, &c.—Sen. Res. M.O. £300.
West London Hospital, Hammersmith-road, W.—Asst. Anæsth.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Hertford, Herts.

Births, Marriages, and Deaths.

BIRTHS.

Davies.—On July 4th, at "Plas-Darland," Wrexham, the wife of John E. H. Davies, D.S.O., M.R.C.S., L.R.C.P., of a son.

Vaile.—On July 2nd, at Albert-mansions, Northumberland-street, W., the wife of Dr. T. B. Vaile, of a son.

MARRIAGES.

Fardon—Kirkland.—On June 28th, at St. Mark's, Reigate, Harold Joseph Fardon, M.D., to Kathleen Nina, elder daughter of the late Arthur Kirkland, and of Mrs. Kirkland, of South Park, Reigate.

Ross—Townsend.—On July 5th, at St. Bartholomew-the-Great, London, James Paterson Ross, F.R.C.S., to Marjorie Burton, younger daughter of Captain F. W. Townsend Botley, Hants.

DEATHS.

Elliott.—On July 4th, at Sonning-on-Thames, Edgar Elliott, M.R.C.S., L.R.C.P., late of Sevenoaks, in his 68th year.

Nall.—On June 29th, suddenly, at Furness Vale, Samuel Nall, B.A., M.B., D.P.H., M.R.C.S. Eng. (Camb. and St. Bart.), the beloved husband of Lizzie Nall, aged 69. For many years in practice at Disley.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

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A little over a year ago a small training home for feeble-minded girls at Fairwarp, near Uckfield, was established by the aid of the East Grinstead Case Committee of the East Sussex Voluntary Association for Mental Welfare. The first annual report of the home has just been issued and shows that the 15 beds with which it was provided are now full. The cost of the home for the year has been £750, which has been met by the payment of £1 per week for each inmate. Only three of the girls admitted have so far proved unsuitable for residence, and the progress made by all the girls in the year seems to the committee to be most satisfactory. An effort has been made to train the girls among pleasant surroundings, to render themselves at least partially self-supporting. The committee hopes to be in a position shortly to increase the scope of the work, and by raising a case fund to provide a free, or nearly free, bed for a local case.

PORTABLE RADIOGRAPHS.

The lack of efficient radiographic facilities is often a severe handicap to the practitioner whose work lies at some distance from the nearest hospital or private installation. To these practitioners the services of a firm possessing complete portable equipment for all kinds of radiographic work should be of great value. A firm known as "Portable Radiographs," of 1, Woodstock-road, Bedford Park, London, W. 4, now undertakes work of this description. The apparatus employed has been specially designed, and is transported in a plain, closed motor, the engine of which supplies the necessary electric current. From the special alternator mounted on the bonnet of the car two wires are led through a convenient window in the sick-room, and are connected at the bedside to the portable X ray apparatus, which is not bulky. At a recent demonstration the complete apparatus was installed and connected in the space of half an hour, three radiograms were taken and developed in the motor-car, and were ready in the course of a few minutes. The whole procedure was efficiently carried out and the definition of the radiograms was excellent. Screen-work can also be undertaken and a screening couch is carried. The firm informs us that it undertakes work for the medical and dental professions only, and that further the staff works under the instruction of the medical man in charge of the case. The various applications of such service are sufficiently obvious. We understand that the apparatus was employed in connexion with the recent Rodeo exhibition at Wembley.

CURATIVE RHYTHM AND THE PRACTITIONER.

To the Editor of The Lancet.

Sir,—Will you permit me to draw the attention of medical men to the treatment known as "curative rhythm" instituted by Miss Anne Walton? Some years ago I wrote a pamphlet entitled "Created Rhythm," in which I pointed out that this treatment is based on the same rhythmic power that seeks expression through nature, music, our varied sciences, arts, literature, &c. I then pleaded that this new treatment should be tested by the medical profession to prove its justification in the same way that massage and suggestion therapy have been tested. I am glad to say that it is becoming more recognised by large numbers of the medical profession that rhythm acts not only as a powerful eliminator of mental and physical disabilities, but also as a powerful mental and physical recuperative. The treatment has been developed quietly in coöperation with medical men, but there are still large numbers who have never heard of it. The method includes relaxation, rhythmic manipulation, suggestion therapy, rhythmic movements combined with breathing. Some of the disorders which have been successfully treated by this method are insomnia, neurasthenia, neuritis, habit spasms, writers' cramp, lack of concentration, faulty posture, and dyspepsia.

Further information can be obtained from the secretary, 24, Welbeck-street, Cavendish-square, W. 1, where this treatment is being carried on. It is also available at Brighton and Harrogate.

I am, Sir, yours faithfully,

Theo. B. Hyslop, M.D., F.R.S.E.

Portland-place, W., *June 26th, 1924.*

PUBLIC HEALTH IN BIHAR AND ORISSA.

With an abundant rainfall, generally favourable in its distribution, the year 1922 was the most prosperous and healthy which this province had known for a considerable period, and was specially characterised by the absence of any important epidemic disease. The death-rate was 24·1 per 1000, as compared with 32·8 in 1921, 39·6 for the preceding five years, and 35·3 for the decennium. The population (census of 1921) was 34,002,189 (not including the tributary States of Orissa, the vital occurrences in which are not included in this report). The birth-rate was 35·0 per 1000, compared with 34·6 in 1921, and 38·4 in the preceding decennium. In Purnea district it was only 26·3; in Angul it was 42·9. The ratio for rural areas was 35·2; for towns 30·0 per 1000. Among the former it varied from 26·5 in Purnea to 42·9 in Angul; for the latter, from 11·1 at Dhanbad and 12·7 at Giridih, to 48·9 at Lalganj and 49·2 at Hajipur. "The low birth-rate recorded in Dhanbad and Giridih is probably due to the large floating population connected with the coal-mines, and to the excess of males in the population of such towns. Defective reporting is also probable, owing to the population of these towns being migratory." Lieut.-Colonel W. C. Ross, Director of Public Health for the province, who presents this report,[1] considers with regard to the death-rate, "that it is unlikely that this high standard will be maintained in future years, but the low rate now reported shows clearly what is possible when conditions are favourable, and what may again be achieved if steady progress is made in the improvement of sanitary conditions." It may be hoped (and indeed expected) that this high standard *will* be maintained. The results of progress are evident, and themselves constitute an encouragement for continuance in the right direction. In regard to infantile mortality the ratio per 1000 births was 139·9, as compared with 159·0 in 1921; in the towns it was 165·9, and in the rural areas 139·1. As to class, or religious persuasion, amongst Hindus, who form the bulk of the population, the death-rate was 24·7; for Mohammedans 20·7; for Christians 14·4; and for "other classes" 22·8 per 1000. In regard to vital statistics Colonel Ross emphasises their importance and utility, regarding them as "the barometer of public health. . . . Let us accept the proposition that public health is an economic question and must be dealt with accordingly."

The general death-rate of the province, as already mentioned, was only 24·1 per 1000; of this total, 17·0 per 1000 is ascribed to "fevers," as compared with 22·6 in 1921, and 27·4, the quinquennial average. This improvement (as regards the average) was manifest in every district of every division. The highest fever mortality ratios were returned from the districts of Palamau (22·1), Muzaffarpur (20·6), and Shahabad (20·3), where the quinquennial averages had been 33·6, 29·1, and 36·2 per 1000 respectively. In Angul district, where the quinquennial fever mortality had been higher than in any other (37·6), the ratio fell to 19·6. Cholera caused 26,805 deaths (0·7 per 1000), all of which, except 852, occurred in the rural areas; and the same ratio per 1000 (0·7) applies equally to these areas and to the towns. The improvement was very great as compared with 2·6 in the previous year, and 3·1 in the quinquennium. In the various districts the mortality ranged from 0·005 in Angul and Singhbhum, and 0·006 in Ranchi, to 2·3 in Muzaffarpur and 4·7 in Balasore. It is satisfactory to learn that "the use of permanganate of potash and chlorinated lime for disinfecting wells has now been generally adopted by local bodies, and the procedure is now generally known and appreciated."

ARTIFICIAL LIMBS.

We have received from Messrs. W. R. Grossmith, Ltd., a small pamphlet entitled "Nature Reproduced," in which are recorded some of the achievements of amputees who use the artificial limbs of this well-known firm. The merits of the "Anglesey" pattern artificial leg, which has been in use in this country since the middle of the last century, have long been known, but have been perhaps unduly overshadowed by the successes achieved by American types, especially those modified and improved by British makers during the war. Nevertheless, the fact remains that Anglesey legs, when properly made and fitted, can be as light as, or even lighter than, any other limbs upon the market, whether made of metal, leather, wood, or composition; their wearers have achieved notable successes in walking competitions and have taken part in all manner of sports and occupations. Their durability when fairly used is shown by the testimony of amputees who have worn the same limb for 20 or 30 years. Recognition of the merits of one type of limb by no means implies condemnation of other types, for in prosthetics the proverb "One man's meat is another man's poison" is most emphatically true. *The personal equation is one of the most important factors in the solution of the problems of prosthetics, and here, again, the man is more than the machine.*

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[1] Public Health Report, 1922. Patna: Superintendent, Government Printing. 1923.

THE LANCET: SUBSCRIPTION RATES.

Inland	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
Abroad	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

An Address
ON
CHRONIC DIARRHŒA.

Delivered before the Derby Medical Society on March 13th, 1924,

By JOHN A. RYLE, M.D., F.R.C.P. Lond.,
ASSISTANT PHYSICIAN TO GUY'S HOSPITAL.

For those of us who are chiefly concerned with clinical problems it is often profitable to discuss the natural history of a single symptom; to consider its several origins and types; and generally to pass in review the diagnostic difficulties to which it may give rise. Such a survey should include a valuation of the methods available for the investigation of the symptom, and should have as one of its aims the practical consideration of how to rationalise treatment. I have chosen as my topic chronic diarrhœa, under which heading may be included recurring or intermittent types of the complaint. I shall, wherever possible, base my remarks on personal clinical observations, referring only to such special or experimental work as seems to have a direct and useful bearing on the question. By diarrhœa we should imply—to quote a formula of J. Ch. Roux—"the too rapid evacuation of too fluid stools," in this way avoiding confusion with certain pseudo-diarrhœas. So far as its actual incidence in practice is concerned, I imagine chronic diarrhœa would not, in our climate and at ordinary times, be regarded as a very common symptom. Nevertheless it is a symptom common to a great variety of diseases, and it may be a very troublesome one to analyse and treat. Furthermore, by reason of the wide extent of our Empire, increasing facilities for travel, and the recent ravages of war, certain types of infective diarrhœa have undoubtedly become more common in this country than they were in previous decades.

For the patient the symptom is mainly a subjective one—that is to say, it is the sensory discomforts and inconveniences which urge him to seek advice. It has, however, an advantage over more strictly subjective experiences in that it is accompanied by the passage of abnormal stools, with regard to the nature and number of which more or less accurate observations are possible. In no type of chronic diarrhœa can we afford to neglect such observations. Sometimes they declare or suggest the diagnosis at once. In all cases they give guidance as to the necessary collateral inquiries. There can be no doubt that modern perfections in domestic sanitation, however great their benefits, have served to hinder the modern physician, and to render him less familiar with the appearances of normal and abnormal fæcal discharges than were his predecessors. It will be within the experience of many of us, too, that the sensibilities of the patient occasionally offer a strong resistance to our attempts to inspect a stool. For these and other reasons the routine inspection and special examination of fæcal specimens have never received the thorough attention accorded to the urinary excretions. I shall have occasion to refer in more detail to this matter as my theme develops.

Classification.

Before we can discuss the several types of diarrhœa and their differential features some form of classification is desirable. The best clinical classifications are usually those based on causal pathology. It so happens in the case of chronic diarrhœa that an anatomical classification of the sites of origin of the symptom is more convenient, and at the same time permits of a clear review of the underlying morbid processes. Thus, by considering in succession the stomach, the small bowel, the large bowel and rectum, and the accessory glands and structures communicating with the di[illegible] (in particular the pancreas, the gall-bladder, and the absorptive apparatus comprising the lacteals and mesenteric glands) we cover the origins of all the important varieties of chronic diarrhœa, with the exception of those depending on external nervous stimuli or due to such complex factors as obtain in the case of Graves's disease.

Those due to nervous factors include a rare form of tabetic diarrhœa, diarrhœa due to reflex stimulation from a neighbouring visceral lesion, and emotional diarrhœa. To diarrhœa of gastric origin the term gastrogenous has been applied, and we might for brevity speak similarly of enterogenous, cologenous, pancreatogenous, psychogenous diarrhœa, and so forth. Such adjectives, however, are open to criticism and do not adequately indicate the cause of the symptom. Diarrhœas may also be broadly classified into those dependent upon functional digestive errors and those dependent upon organic and usually ulcerative intestinal disease. With most of us it will probably have been a natural inclination to regard diarrhœa as essentially a bowel symptom. It is, however, no more essentially a symptom of primary bowel disease than tachycardia is a symptom of heart disease, or dyspepsia of stomach disease. At the outset, therefore, the classification which I have suggested reminds us of the necessity in an individual case of reviewing widely diverse possibilities, and of arranging our interrogation of the patient in such a way as to obtain information relating to the function of many parts.

Methods of Investigation.

Assuming a careful history to have been taken and a routine overhaul made, it becomes necessary to consider what special examinations should be conducted in a given case. These examinations may be usefully subdivided into (*a*) essential clinical examinations; (*b*) valuable and often essential accessory investigations which yet fall within the scope and province of the clinician; (*c*) special examinations for which it is usually preferable to obtain the coöperation of an expert in chemical, bacteriological, or radiographic methods.

The essential clinical examinations include inspection of the stools and a rectal examination, and should, strictly speaking, be omitted in no case of chronic diarrhœa.

The accessory investigations falling within the province of the clinician, but in which he may sometimes elect to obtain coöperation, include a direct inspection of the rectum or sigmoid through a proctoscope or sigmoidoscope; a simple microscopic examination of the stools for blood, pus, meat-fibres, &c.; a chemical examination of the stools for the presence of blood, or of a filtrate of the stools for albumin; and occasionally the examination of a blood film. Observing the rate of passage of charcoal given by the mouth is another simple and sometimes useful test.

The special laboratory examinations include gastric analysis; examination of the stools for amœbæ, cysts, parasites and ova, fatty crystals, &c.; chemical analyses of the fatty content of the stools; tests for pancreatic efficiency, and various bacteriological and serological procedures. For the study of the stools with a view to estimating the utilisation of various foodstuffs it may be necessary to employ a special diet, such as that recommended by Schmidt. The radiologist may give useful information as to the rate of passage of an opaque meal through various portions of the alimentary tract, and after an opaque enema may sometimes provide positive evidence of the presence of a colonic growth.

Diarrhœa of Gastric Origin.

The text-books of general medicine accord little or no space to the consideration of this interesting group of diarrhœas, nor does it appear to be widely recognised in practice. Nevertheless it is one of the most important. Numerically it accounts for more cases than any other single group excepting the colonic group. In the majority of cases of gastric diarrhœa there is a great diminution or complete absence of

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the free hydrochloric acid of the gastric juice, and to the extent that *complete* relief of the diarrhœa is nearly always afforded by the therapeutic administration of dilute hydrochloric acid it would seem that the deficiency is in itself an essential factor.

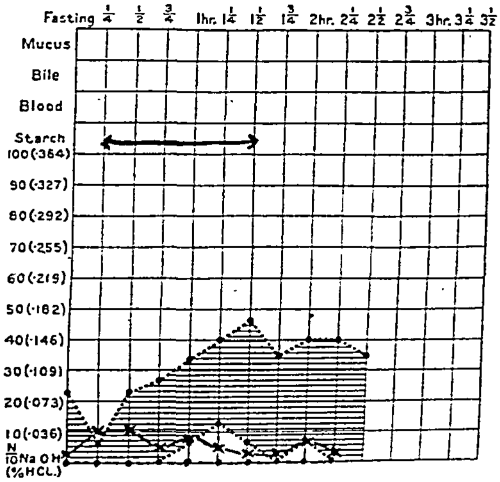
Achlorhydria may be primary or secondary. It may depend either on a true and possibly inherited absence of the normal secretion, in which case the title achylia gastrica becomes applicable, or upon factors causing excessive neutralisation, such as oversecretion of mucus and an undue degree of duodenal regurgitation. Achlorhydria may be unaccompanied by any symptoms whatsoever, and was found by Bennett and myself[1] in 4 per cent. of 100 healthy students. It occurs in upwards of 10 per cent. of dyspeptics and in a great variety of other conditions. It is common but not constant in pellagra and sprue, in chronic gastritis, and in malignant disease. In Addison's anæmia and subacute combined degeneration of the cord it occurs in almost every case. Diarrhœa may be the only symptom of achlorhydria. In Addison's anæmia it is important to recognise that it may antedate the appearance of the anæmia and other classical signs by months or even by many years.

The clinical features of a case of simple gastric diarrhœa are as follows. The evacuations are not as a rule very frequent, three or four stools in the course of the day being a common account, though occasionally they may be as numerous as six or eight. They are generally entirely unaccompanied by pain or colicky sensations—an important point in differentiating them from intestinal diarrhœas. The stools are loose and unformed rather than fluid. Owing to their rapid passage through the alimentary tract they are of a paler brown than the average normal stool. They contain neither mucus nor blood. In virtue of their rapid passage they may show microscopically the presence of undigested meat fibres. Schmidt[2] pointed out that on a diet including raw or underdone meat connective tissue particles (which can only undergo digestion in the presence of gastric juice) may be readily recognised in the fæces of patients with gastric hurry and hyposecretion. The diarrhœa has a *tendency to occur in the early morning* and to be precipitated by meals. Associated symptoms, if any, are referred rather to the stomach than elsewhere. Epigastric discomfort, slight nausea and sinking feelings, intolerance of alcohol, fats, soups, and fluid meals are among the subjective complaints. In a secondary achlorhydria due to gastritis of alcoholic origin, or due to gross oral sepsis, morning nausea and retching may be present. Acne rosacea was shown by Barber and myself[3] to be associated with achlorhydria in a high proportion of cases, and I have more than once been persuaded of the gastric origin of a chronic diarrhœa by the coexistence of this unmistakable skin lesion. Abdominal and rectal examinations are negative. Careful steps should always be taken to exclude Addison's anæmia, and splenic enlargement or a history of sore tongue or of sensory manifestations pointing to central nervous disease should be seriously regarded.

A fractional test-meal in the majority of cases shows complete absence of free acid throughout the meal, and a very low curve of total acidity. Usually there is rapid emptying, the stomach sometimes being void within a half to three-quarters of an hour instead of in the more usual period of two hours. A radiographic examination with an opaque meal shows a similar rapid emptying and rapid passage throughout the intestinal tract. This rapid evacuation of the stomach, with consequent over-stimulation of activity in the small intestine (and possibly inadequate stimulation of the pancreas) is the actual cause of the diarrhœa. The remarkable and almost constant response to the therapeutic administration of dilute hydrochloric acid in these cases suggests that the acid-control of the pylorus may play a more important part in the behaviour of this sphincter than physiologists have latterly been inclined to allow. The therapeutic test of giving acid may be an important diagnostic point when other methods of investigation are not available.

The treatment includes, where possible, the removal of any likely cause of a secondary achlorhydria, such as alcoholic excess or dental sepsis. An alcoholic diarrhœa, perhaps more commonly seen in beer-drinkers than spirit-drinkers, will improve or clear up altogether if the patient succeeds in altering his habits, and it can be shown that an achlorhydria may under these circumstances be replaced by a normal secretory curve. In simple, unexplained diarrhœa associated with achlorhydria, in Addison's anæmia, and in subacute combined degeneration of the cord, hydrochloric acid should always be given. As the antiseptic, as well as the physiological action of acid, is probably of real importance it should, in fact, be prescribed over long periods or continuously in every case of achlorhydric diarrhœa. Doses as small as 10 or 20 minims of the dilute preparation three times a day may be successful in checking the frequent evacuations, but if antisepsis is aimed at doses of a drachm or more should be given. Taken with lemonade or orangeade with the three main meals it is quite a pleasant beverage. I have also seen one or two cases of chronic diarrhœa, apparently of gastric origin, in which complete relief followed the taking of acid, notwithstanding that gastric analysis gave normal figures.

The following case is instructive. In the early stages the patient's symptoms were those of a simple gastric diarrhœa, but were not recognised as such. Later he developed Addison's anæmia. The accompanying chart illustrates the test-meal findings characteristic of both conditions.



The shaded area represents the limits for free HCl. of 80% of normal people.

●——● represents free HCl.

×——× represents total acidity.

A middle-aged man came under observation on account of severe anæmia, with a history of breathlessness and failing strength of about one year's duration. For nine years he had been troubled by a chronic painless type of diarrhœa. Seven years previously an X ray examination had shown a rapidly emptying stomach and exceedingly rapid evacuation of the barium. The blood picture was typical of Addison's anæmia, and a test-meal showed complete achlorhydria. Within 24 hours of starting to take hydrochloric acid the diarrhœa was entirely controlled.

Diarrhœa After Gastro-enterostomy.

One other type of gastric diarrhœa resulting from unsuccessful or *too* successful surgery deserves mention. From time to time one sees patients who have had a gastro-enterostomy performed, and have thereafter developed chronic or intermittent diarrhœa. There are two types, a benign one which is fortunately the more common, and a rare one associated with other and graver symptoms. The benign type closely simulates the simple gastric diarrhœa already described. It is due to a too patent stoma causing excessively rapid emptying, with the result that there is no time for gastric digestion to take place. There is over-neutralisation of the gastric juice, and consequently an artificial achlorhydria; pancreatic secretion, and certainly exposure to pancreatic secretion, may also be inadequate. The stools are light in colour, and may show fatty crystals and meat fibres, but no blood. There is no pain, but there is often discomfort referred to the small bowel area surrounding the navel and occurring almost immediately after food. In a case of this kind recently under my care the patient had once noticed fragments of egg white in the stools within half an hour of their ingestion; X rays showed the stomach to be empty in ten minutes; test-meal showed achlorhydria, and the stools contained soaps, fatty acids, and meat fibre in excess of normal. Dry meals, lying down after the main meals, and the administration of acid (provided there is no persisting evidence of gastric, duodenal, or jejunal ulceration) often give relief, and pancreatin may be helpful.

The serious type is due to the development of a jejuno-colic fistula as the result of jejunal ulceration. In such cases pain, great emaciation, and vomiting may be present in addition to the diarrhœa, and gastric acidity is likely to be high.

DIARRHŒA ORIGINATING IN THE SMALL BOWEL.

There is only one important cause of diarrhœa in this group—namely, tuberculous ulceration of the ileum. For this reason diagnosis should seldom be in doubt as (excepting in the far less common variety of localised ileo-cæcal tuberculosis) there is nearly always active coexisting lung disease or abdominal tuberculosis. The frequency of the calls to stool is very variable, and it should, of course, be recognised that ulceration may be present with constipation. Generally the frequency bears some kind of relation to the extent of the disease. A common story is four to six actions daily—a rather higher average figure than in most cases of gastric diarrhœa, but a lower one than obtains in ulcerative lesions of comparable severity in the large bowel. In contradistinction to the gastric group pain is a frequent and troublesome association. It is usually referred to the peri-umbilical and right iliac zones, and tenderness in the right iliac fossa is commonly present. There is the same post-prandial tendency to looseness as in the diarrhœas of gastric origin, and hot soups and fluids are especially disturbing. The stools are soft or semi-fluid, and light in colour. It is rare for macroscopic blood or mucus to be present, but positive results with the benzidine, guaiac, and spectroscopic tests are obtainable. If the ulceration be very extensive, and particularly if there be much involvement of the mesenteric glands causing obstruction to the lymphatic flow, the stools may be copious and chalky-looking and contain excess of fats and soaps, while in virtue of the diarrhœa undigested meat fibres may be present. With appropriate technique tubercle bacilli can also be demonstrated.

Treatment in these cases can only be palliative, but Gull[4] pointed out as long ago as 1855 the importance of avoiding the then common practice of giving cod-liver oil or a diet rich in milk and cream in cases of tuberculous disease in which fat absorption is at fault.

DIARRHŒA ORIGINATING IN DISEASE OF THE COLON AND RECTUM.

This is a most important group, and is more beset with difficulties than either of those to which I have referred. It includes the chronic phases of amœbic and bacillary dysentery, other forms of infective ulceration of the colon of unspecified origin, non-ulcerative types or stages of colitis, malignant ulceration of the colon and rectum, the terminal colitis of Bright's disease, certain spurious forms of colitis and diarrhœa, such as that which is commonly classified as "muco-membranous," and those due to constipation, abuse of purgatives, and excess of douching. In this group more than any other careful rectal examination, direct inspection of the mucosa through a sigmoidoscope, and macroscopic and microscopic examinations of the stools are of importance. It is in this group that serious mistakes are made through omission of simple examinations. It will probably have been within the experience of many of us to discover a rectal carcinoma, perhaps in a patient below the common age, primarily regarded and treated, sometimes for months, as a case of "diarrhœa," "colitis," or "piles." I see two or three such cases every year, and there are other pitfalls; I have, for instance, in the last two years seen three patients who had at some previous date suffered from dysentery or ulcerative colitis, but in whom a carcinoma of the colon had subsequently developed and been missed in spite of careful investigations. The old story of colitis or dysentery had served to lull suspicion instead of rousing it, for there is, I believe, a definitely increased liability to malignancy in persons who have previously suffered from chronic infective ulceration of the large bowel.

In a considerable proportion of all cases of diarrhœa from active colonic or rectal ulceration, from whatever cause, blood, mucus, and sometimes pus will have been observed by the patient himself at some period of his illness. So long as ulceration persists blood will be demonstrable microscopically and chemically, if not macroscopically, for the cells have not, as in bleeding at a higher level, had time to undergo disintegration. Leucocytes much more readily undergo disintegration, and for this reason their presence in large numbers points to a lesion low down in the large bowel or to an abscess discharging thereinto. Goiffon[5] states that albumin in the filtrate from a fæcal emulsion is a reliable index of the presence of active bowel ulceration, but I have not employed the test myself. Pain, both colicky and (if there is extensive inflammation of the wall of the bowel) more continuous, and accompanied by tenderness, is a frequent but not constant association of all ulcerative forms of colitis. It is commonly referred to the lower abdomen, and especially to the region of the descending colon and rectum, and is most in evidence during or after defæcation. The diarrhœa may be continuous or intermittent and, particularly in cases of malignant disease, may alternate with constipation. In an acute phase the evacuations are frequent and small, and consist largely of blood, mucus, and sometimes pus. In the more chronic phases they may be watery and intermixed with fæcal material, the blood and mucus being less conspicuous. With growths low down in the colon and in the rectum the blood may sometimes be so intimately mixed with a watery brown malodorous evacuation as to escape the patient's notice. When not sufficiently obvious on a casual inspection blood and mucus can often be made apparent by gently tilting the bed-pan—a receptacle which should always be employed in preference to others in suspicious cases; the viscid mucous fragments are then seen to slide more slowly across the white field than the fluid elements of the stool. Washing with water may also bring abnormal particles to light.

The Dysenteries.

In the case of the dysenteries it is important to recognise that both varieties (though more rarely that due to *Entamœba histolytica*) may be acquired in this country, and that relapses after periods of good health are common. Of the two the amœbic variety is the more likely to give rise to a chronic mild diarrhœa with little or no pain. The asylum dysenteries have been shown to be generally due to bacillary infections, and Hurst[6] has suggested that a considerable proportion of the sporadic cases formerly classified as "ulcerative colitis" are in reality chronic bacillary dysentery. From the point of view of the morbid changes in the mucosa no distinction can be drawn between chronic bacillary dysentery and chronic "ulcerative colitis," and a certain proportion of cases of the latter show a very remarkable response to treatment with polyvalent anti-dysentery serum. When it is remembered that only a comparatively the free hydrochloric acid of the gastric juice, and to the extent that complete relief of the diarrhœa is nearly always afforded by the therapeutic administration of dilute hydrochloric acid it would seem that the deficiency is in itself an essential factor.

Achlorhydria may be primary or secondary. It may depend either on a true and possibly inherited absence of the normal secretion, in which case the title achylia gastrica becomes applicable, or upon factors causing excessive neutralisation, such as over-secretion of mucus and an undue degree of duodenal regurgitation. Achlorhydria may be unaccompanied by any symptoms whatsoever, and was found by Bennett and myself[1] in 4 per cent. of 100 healthy students. It occurs in upwards of 10 per cent. of dyspeptics and in a great variety of other conditions. It is common but not constant in pellagra and sprue, in chronic gastritis, and in malignant disease. In Addison's anæmia and subacute combined degeneration of the cord it occurs in almost every case. Diarrhœa may be the only symptom of achlorhydria. In Addison's anæmia it is important to recognise that it may antedate the appearance of the anæmia and other classical signs by months or even by many years.

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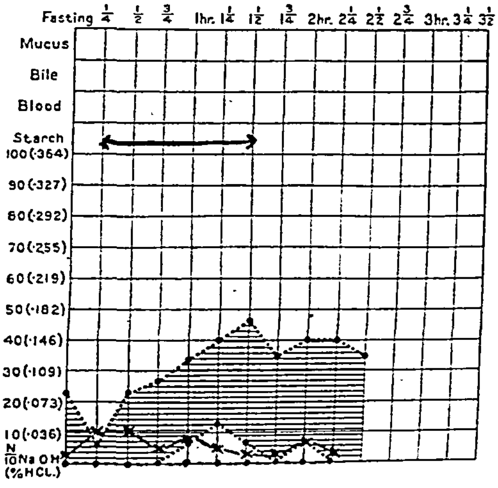

The shaded area represents the limits for free HCl. of 80% of normal people.

●———● represents free HCl.

×———× represents total acidity.

A middle-aged man came under observation on account of severe anæmia, with a history of breathlessness and failing strength of about one year's duration. For nine years he had been troubled by a chronic painless type of diarrhœa. Seven years previously an X ray examination had shown a rapidly emptying stomach and exceedingly rapid evacuation of the barium. The blood picture was typical of Addison's anæmia, and a test-meal showed complete achlorhydria. Within 24 hours of starting to take hydrochloric acid the diarrhœa was entirely controlled.

Diarrhœa After Gastro-enterostomy.

One other type of gastric diarrhœa resulting from unsuccessful or too successful surgery deserves mention. From time to time one sees patients who have had a gastro-enterostomy performed, and have thereafter developed chronic or intermittent diarrhœa. There are two types, a benign one which is fortunately the more common, and a rare one associated with other and graver symptoms. The benign type closely simulates the simple gastric diarrhœa already described. It is due to a too patent stoma causing excessively rapid emptying, with the result that there is no time for gastric digestion to take place. There is over-neutralisation of the gastric juice, and consequently an artificial achlorhydria; pancreatic secretion, and certainly exposure to pancreatic secretion, may also be inadequate. The stools are light in colour, and may show fatty crystals and meat fibres, but no blood. There is no pain, but there is often discomfort referred to the small bowel area surrounding the navel and occurring almost immediately after food. In a case of this kind recently under my care the patient had once noticed fragments of egg white in the stools within half an hour of their ingestion; X rays showed the stomach to be empty in ten minutes; test-meal showed achlorhydria, and the stools contained soaps, fatty acids, and meat fibre in excess of normal. Dry meals, lying down after the main meals, and the administration of acid (provided there is no persisting evidence of gastric, duodenal, or jejunal ulceration) often give relief, and pancreatin may be helpful.

The serious type is due to the development of a jejuno-colic fistula as the result of jejunal ulceration. In such cases pain, great emaciation, and vomiting may be present in addition to the diarrhœa, and gastric acidity is likely to be high.

Diarrhœa Originating in the Small Bowel.

There is only one important cause of diarrhœa in this group—namely, tuberculous ulceration of the ileum. For this reason diagnosis should seldom be in doubt as (excepting in the far less common variety of localised ileo-cæcal tuberculosis) there is nearly always active coexisting lung disease or abdominal tuberculosis. The frequency of the calls to stool is very variable, and it should, of course, be recognised that ulceration may be present with constipation. Generally the frequency bears some kind of relation to the extent of the disease. A common story is four to six actions daily—a rather higher average figure than in most cases of gastric diarrhœa, but a lower one than obtains in ulcerative lesions of comparable severity in the large bowel. In contradistinction to the gastric group pain is a frequent and troublesome association. It is usually referred to the peri-umbilical and right iliac zones, and tenderness in the right iliac fossa is commonly present. There is the same post-prandial tendency to looseness as in the diarrhœas of gastric origin, and hot soups and fluids are especially disturbing. The stools are soft or semi-fluid, and light in colour. It is rare for macroscopic blood or mucus to be present, but positive results with the benzidine, guaiac, and spectroscopic tests are obtainable. If the ulceration be very extensive, and particularly if there be much involvement of the mesenteric glands causing obstruction to the lymphatic flow, the stools may be copious and chalky-looking and contain excess of fats and soaps, while in virtue of the diarrhœa undigested meat fibres may be present. With appropriate technique tubercle bacilli can also be demonstrated.

Treatment in these cases can only be palliative, but Gull[4] pointed out as long ago as 1855 the importance of avoiding the then common practice of giving cod-liver oil or a diet rich in milk and cream in cases of tuberculous disease in which fat absorption is at fault.

Diarrhœa Originating in Disease of the Colon and Rectum.

This is a most important group, and is more beset with difficulties than either of those to which I have referred. It includes the chronic phases of amœbic and bacillary dysentery, other forms of infective ulceration of the colon of unspecified origin, non-ulcerative types or stages of colitis, malignant ulceration of the colon and rectum, the terminal colitis of Bright's disease, certain spurious forms of colitis and diarrhœa, such as that which is commonly classified as "muco-membranous," and those due to constipation, abuse of purgatives, and excess of douching. In this group more than any other careful rectal examination, direct inspection of the mucosa through a sigmoidoscope, and macroscopic and microscopic examinations of the stools are of importance. It is in this group that serious mistakes are made through omission of simple examinations. It will probably have been within the experience of many of us to discover a rectal carcinoma, perhaps in a patient below the common age, primarily regarded and treated, sometimes for months, as a case of "diarrhœa," "colitis," or "piles." I see two or three such cases every year, and there are other pitfalls; I have, for instance, in the last two years seen three patients who had at some previous date suffered from dysentery or ulcerative colitis, but in whom a carcinoma of the colon had subsequently developed and been missed in spite of careful investigations. The old story of colitis or dysentery had served to lull suspicion instead of rousing it, for there is, I believe, a definitely increased liability to malignancy in persons who have previously suffered from chronic infective ulceration of the large bowel.

In a considerable proportion of all cases of diarrhœa from active colonic or rectal ulceration, from whatever cause, blood, mucus, and sometimes pus will have been observed by the patient himself at some period of his illness. So long as ulceration persists blood will be demonstrable microscopically and chemically, if not macroscopically, for the cells have not, as in bleeding at a higher level, had time to undergo disintegration. Leucocytes much more readily undergo disintegration, and for this reason their presence in large numbers points to a lesion low down in the large bowel or to an abscess discharging thereinto. Goiffon[5] states that albumin in the filtrate from a fæcal emulsion is a reliable index of the presence of active bowel ulceration, but I have not employed the test myself. Pain, both colicky and (if there is extensive inflammation of the wall of the bowel) more continuous, and accompanied by tenderness, is a frequent but not constant association of all ulcerative forms of colitis. It is commonly referred to the lower abdomen, and especially to the region of the descending colon and rectum, and is most in evidence during or after defæcation. The diarrhœa may be continuous or intermittent and, particularly in cases of malignant disease, may alternate with constipation. In an acute phase the evacuations are frequent and small, and consist largely of blood, mucus, and sometimes pus. In the more chronic phases they may be watery and intermixed with fæcal material, the blood and mucus being less conspicuous. With growths low down in the colon and in the rectum the blood may sometimes be so intimately mixed with a watery brown malodorous evacuation as to escape the patient's notice. When not sufficiently obvious on a casual inspection blood and mucus can often be made apparent by gently tilting the bed-pan—a receptacle which should always be employed in preference to others in suspicious cases; the viscid mucous fragments are then seen to slide more slowly across the white field than the fluid elements of the stool. Washing with water may also bring abnormal particles to light.

The Dysenteries.

In the case of the dysenteries it is important to recognise that both varieties (though more rarely that due to *Entamœba histolytica*) may be acquired in this country, and that relapses after periods of good health are common. Of the two the amœbic variety is the more likely to give rise to a chronic mild diarrhœa with little or no pain. The asylum dysenteries have been shown to be generally due to bacillary infections, and Hurst[6] has suggested that a considerable proportion of the sporadic cases formerly classified as "ulcerative colitis" are in reality chronic bacillary dysentery. From the point of view of the morbid changes in the mucosa no distinction can be drawn between chronic bacillary dysentery and chronic "ulcerative colitis," and a certain proportion of cases of the latter show a very remarkable response to treatment with polyvalent anti-dysentery serum. When it is remembered that only a comparatively small proportion of acute bacillary dysenteries give positive cultural results it is no cause for surprise that chronic cases are generally negative from the bacteriological standpoint. This uncertainty in laboratory diagnosis renders a direct visual examination of the diseased surface all the more important. So valuable diagnostically is the appearance of the local lesion that a digression on the application of sigmoidoscopy in all forms of colitis, whether suspected of belonging to a surgical or medical category may, perhaps, be pardoned.

Although, as with other endoscopic instruments, technical difficulties are encountered from time to time, no special manipulative skill is necessary for the use of the sigmoidoscope. It is a simple instrument and, with practice and due care, its employment entails little or no risk. Unless there is ulceration of the anal canal or a concomitant pelvic inflammation its passage—though uncomfortable—is practically painless, and an anæsthetic is seldom necessary and should preferably not be given.

Unless general weakness or special circumstances forbid, the patient should be examined in the knee-elbow position. There should be as little preparation beforehand as possible, and the clearest views are often obtained in patients who have simply been instructed to get up and empty the bowel voluntarily two or three times in the few hours before the examination. Purgatives are best avoided altogether, but simple preliminary lavage may be necessary. A hypodemic of morphine, 20 minutes before the examination, serves to allay anxiety and to lessen peristalsis. After the first few inches are passed the instrument must be guided visually.

In *ulcerative colitis and chronic bacillary dysentery* all phases between a granular mucosa with a tendency to bleed easily and extensive, but usually superficial, ulceration may be seen. The ulcers, except in very severe types, are shallow and their margins are not raised or undermined. The intervening mucosa is never healthy, appearing red, swollen, and easily bleeding. A film of muco-pus frequently covers the ulcerated areas. In cases of long-standing a condition of generalised polyposis may develop.

In the chronic forms of *amœbic dysentery* seen in this country it is rare to find extensive ulceration; but the appearances, though often slight and inconspicuous, may be completely diagnostic. The ulcers are usually quite minute and round and appear as tiny central craters in a small elevation of the mucosa. The craters may be empty or contain a yellow slough, in which case they are not unlike small boils or carbuncles. The intervening mucosa looks healthy. After a few doses of emetine the whole mucosa may become absolutely normal in appearance. I have seen the diagnosis of chronic amœbic diarrhœa made on these appearances in a case in which skilled laboratory investigation completely failed to discover either amœbæ or cysts. The condition responded at once to emetine. In no case, therefore, of possible amœbic diarrhœa can we accept a negative laboratory diagnosis as final unless we have also used our own eyes to inspect the attainable regions of the lower bowel. Thereafter we have still the therapeutic test. It should, of course, be remembered that amœbic infections may involve a higher level; that they have a predilection for the cæcum; and that when we observe healing lower down it does not necessarily imply that it is complete higher up.

The special laboratory investigations in the suspected dysenteries include a search for amœbæ and cysts; cultivations from particles of muco-pus or direct swabbings from an ulcer through the sigmoidoscope; and testing the patient's serum against known bacillary types.

I shall not here embark upon a discussion of the treatment of chronic dysentery and ulcerative colitis beyond saying that treatment should always be instituted as early as possible, and that (whatever symptomatic and local measures are used) it should be as specific as possible, or, in other words, based on as accurate a diagnosis as circumstances will permit. Time lost in palliative measures may seriously prejudice the outlook. Serum or emetine may both be given on a sigmoidoscopic diagnosis without waiting for laboratory reports, just as antidiphtheritic serum is given to cases of "clinically positive" sore-throat. In diarrhœa due to carcinoma coli the stools show the presence of blood and, if low down, of pus cells. They are often very malodorous and fluid. When the accessible part of the bowel appears normal, but there is a clear history of blood and mucus, or these can actually be seen coming down from a higher level with the sigmoidoscope, growth should be strongly suspected. I shall quote a single case in which my own provisional diagnosis was wrong, merely to illustrate the corrective value of sigmoidoscopy and a microscopic examination of the stools.

A man, aged 53, consulted me on account of diarrhœa of one month's duration, associated with some epigastric pain. The evacuations numbered six or seven per diem. He stated that he had had several similar attacks of shorter duration during the previous ten years. His wife stated that he was always inclined to looseness. There was no lower abdominal pain, though he had had pain in the lumbo-sacral region. He used to drink enormous quantities of beer, but had latterly given up beer altogether and admitted only to small quantities of gin and whiskey. His teeth had been extracted on account of bad oral sepsis, and he was wearing a very ill-fitting denture. Appetite was not impaired, but there had been a drop in weight amounting to six pounds in a month. The history of alcoholic excess and dental sepsis; the long-standing history of diarrhœa; the reference of pain to the epigastrium; a red nose, and a negative abdominal and rectal examination suggested to me a diagnosis of chronic gastritis with achlorhydria. However, his age, loss of weight, and a bad family history prompted further investigation. Sigmoïdoscopy revealed a proliferative and ulcerated growth at a point 22 c.cm. above the anus, and on the same day my colleague, Dr. J. H. Ryffel, reported red cells and pus in the fæces, and suggested the probability of carcinoma coli. Test-meal showed a low normal curve of acidity. The patient, who was certainly not very observant, had never noticed blood or mucus in his stools.

Radiography may sometimes be of the greatest value in the diagnosis, and particularly in the localisation of a colonic carcinoma, but *negative radiographic evidence should never be accepted as final.* I have seen one case in which a completely negative report on the transit of barium given by enema was submitted, and in which acute obstruction from an annular carcinoma took place within the ensuing 24 hours. In another non-diarrhœic case a confident negative report from a radiologist—in spite of a suspicious local delay, described as being due to a spasm—resulted in the allaying of clinical suspicions in a case in which clinical history might have justified a laparotomy.

Spurious and Artificial Colonic Diarrhœas.

Under this heading, which includes types not strictly conforming to Roux' definition, I propose to consider muco-membranous colitis or, as it is better called, muco-membranous colic, and those artificial diarrhœas which sometimes accompany chronic constipation and the prolonged abuse of purgatives.

The picture of muco-membranous colic is a familiar one. It occurs in women of a particular nervous type in whom chronic anxiety and depression have developed in relation to the state of their excreta and many other things; they are generally of sallow habit and have dark skins; they suffer much from abdominal pain referred especially to the descending colon, which may be unduly palpable as a hard cord; their evacuations are too frequent and they often say that they have diarrhœa. Strictly speaking, the stools are too fluid only to the extent that they are passed in association with large quantities of coagulated mucus often in the form of long casts. If examined carefully and at a time when purgatives are not being taken, it will generally be found that the fæces are fragmentary and constipated. Blood and pus are absent, and the mucous membrane appears normal or only slightly red through the sigmoidoscope. The condition is really one of spasmodic constipation, and the large quantities of mucus are the result of irritation and over-secretion rather than of actual inflammation. If treatment with purgatives or douches has been carried out over long periods, or there has been much fæcal retention, a true irritative colitis with diarrhœa may be superadded. With chronic rectal constipation or dyschezia, erroneously treated with salts or irritating laxatives, it is not uncommon for small ineffectual fluid stools to be passed, but rectal and abdominal examination will disclose an accumulation of scybala in the lower bowel, and discontinuance of the purgative medicines and the institution of rational hygienic measures should relieve the condition.

DIARRHŒA DUE TO DISEASE OF THE PANCREAS.

Bright[7] was the first in this country to draw attention to the occurrence of fatty diarrhœa in certain cases of carcinoma of the pancreas involving the duodenum. Pancreatic diarrhœa is actually a very rare condition, though mainly on the strength of laboratory reports it has become rather a fashionable diagnosis in certain quarters. The chief feature of the stools in a true pancreatic diarrhœa is the passage of fat in the shape of oil or a fatty coagulum, or of oil which later congeals as a fatty layer. Microscopically fat globules are shown and undigested meat fibres and starch are also present. The diastase test in the urine, or glycosuria may give further evidence of impaired pancreatic function. Carcinoma, calculi, and chronic pancreatitis are among the conditions in which a true pancreatic fatty diarrhœa has been described.

FATTY OR CHYLOUS DIARRHŒA FROM DISEASE OF THE ABSORPTIVE SYSTEM.

There is, however, another important cause of fatty diarrhœa, as Gull[8] originally pointed out, in which the fat is passed intimately mixed with the stools and is largely present as split fats, appearing under the microscope as crystals and soaps. The stools under these conditions are very bulky, in some cases almost incredibly so. They are pultaceous, pale or greyish in colour, greasy and rancid, and they may froth like soap when water is poured upon them. The absorptive apparatus includes the intestinal mucosa and the lacteal tree. Gull recorded the occurrence of fatty stools of this type in tuberculous disease of the mesenteric glands, and I[9] have recently reported similar cases in which in the course of a laparotomy the lacteals were actually seen to be enormously distended with chyle, owing to obstruction by caseous glands in the mesentery. Other conditions in which stools of similar character may be encountered include the so-called cœliac affection in children, tropical sprue, and occasional cases of abdominal malignant disease. In sprue and cœliac disease other symptoms which may accompany the fatty diarrhœa of tabes mesenterica (such as tetany due to the excessive excretion of calcium) are also recorded, and I have, therefore, put forward the suggestion that the diarrhœa in these conditions will possibly be found to be due to obstruction of the lacteals by some other non-tuberculous disease of the mesenteric glands. One of my cases is perhaps worth describing in brief.

A bright-looking and fairly well-nourished girl, aged 23, came under observation on account of chronic diarrhœa and tetany. The stools were enormously bulky, of a porridgy consistency, greyish, and rancid. Under the microscope fatty crystals, soapy fragments, and meat fibres were demonstrated, and a suspicion of pancreatic disease was in consequence entertained. A laparotomy became necessary on account of appendicular symptoms. It was then seen that the lacteals were all greatly distended with chyle, and that this was due to obstruction by caseous glands. Withdrawal of fats from the diet resulted in the passage of formed stools and a cessation of the tetany. There had been a tendency to diarrhœa since infancy, and the tetany had first appeared six years previously, so that without other grave general symptoms or undue abdominal enlargement a condition of tabes mesenterica must have been present for a very long time.

The treatment of all cases of fatty diarrhœa in which faulty absorption is suspected should include rigid fat restriction. It is remarkable what improvement in respect of the diarrhœa, weight, general nutrition, and other secondary symptoms may follow this simple procedure.

SIMPLE DIARRHŒA ACCOMPANYING MESENTERIC GLANDULAR TUBERCULOSIS.

In addition to a true fatty or chylous diarrhœa, we should also recognise a simple form of mild chronic diarrhœa with passage of light-coloured stools, which is among the earliest symptoms in tuberculous disease of the abdominal lymphatic glands. The symptoms may be present long before the abdomen becomes appreciably enlarged or without other classical signs of tabes mesenterica ever appearing. I have seen several cases of this type in the past year in which further investigations strongly supported a diagnosis largely prompted by this symptom. The condition is practically confined to children and young adults. The following is a case in point:—

A small girl, aged 11, was brought to see me on account of attacks of lower abdominal pain. For some time past her mother had noticed that she was having her bowels moved too frequently. The stools were reported as loose and light in colour, and this was confirmed on making a rectal examination. Her mother and teacher had both observed that she easily became tired, and she often went to bed on her own initiative long before her usual bedtime. The pain in the attacks she referred to both iliac fossæ—a rather common reference in these cases. I suggested keeping her under observation at home, with morning, afternoon, and evening temperature records. The five o'clock mouth temperature (the hour at which she often wanted to go to bed) was found to be nearly always 99 or above, and on one occasion it was 100. X ray examination of the thorax showed shadows of numerous small calcified glands at the hila, and considerable peri-hilar infiltration. Rest in bed, with a diet in which fats were kept low, resulted in a steady gain in weight and a cessation of the diarrhœa. The daily swing of temperature steadily diminished. There were no further attacks of abdominal pain. At no period were any of the characteristic signs of tabes mesenterica present.

I do not imagine that the diarrhœa in these cases expresses ileal ulceration, but rather that it signifies agian a fault of absorption due to glandular disease, though of a lesser degree than that encountered in the very occasional cases of fully developed chylous diarrhœa. The diarrhœa of lardaceous disease—now so rarely seen—probably depends in part on faulty absorption due to amyloid changes in the intestinal mucosa.

DIARRHŒA IN CHRONIC CHOLECYSTITIS.

In chronic mild infections of the gall-bladder, persistent or intermittent diarrhœa of a mild grade is a not uncommon complaint. The associated symptoms include epigastric or right subcostal pains and discomforts; a dyspepsia of which nausea and right subscapular or interscapular pain are frequent features; vague general ill-health; a tendency to unexplained spikes of pyrexia, and other manifestations peculiar to chronic infections of the upper gastro-intestinal tract. There is usually tenderness at the gall-bladder point. I am not sure whether the diarrhœa in these cases should be regarded as a reflex diarrhœa akin to the accompanying reflex dyspepsia, or as an expression of the general upper-tract infection, or possibly of the achlorhydria which is found in a certain proportion of the cases. Cultural investigations of the bile obtained through a duodenal tube may support the clinical diagnosis. The treatment is the treatment of cholecystitis. If gall-stones are not suspected and there is no sufficient indication for surgery it should in the first instance comprise general [illegible] and dietary measures, and the administration of biliary antiseptics such as urotropine and [illegible].

DIARRHŒA DUE TO ORGANIC NERVOUS DISEASE.

I do not propose to discuss tabetic diarrhœa. French authors, of whom Timbal[9] mentions several, have described a true diarrhœa in tabes, but I have not personally seen a case. The only one in my experience in which the diagnosis might have been entertained did not conform to Roux's definition; that is [illegible], although the patient—an undoubted tabetic [illegible] small proportion of acute bacillary dysenteries give positive cultural results it is no cause for surprise that chronic cases are generally negative from the bacteriological standpoint. This uncertainty in laboratory diagnosis renders a direct visual examination of the diseased surface all the more important. So valuable diagnostically is the appearance of the local lesion that a digression on the application of sigmoidoscopy in all forms of colitis, whether suspected of belonging to a surgical or medical category may, perhaps, be pardoned.

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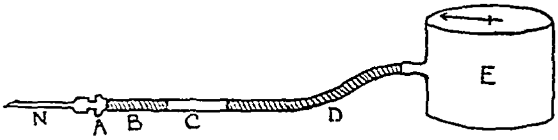
These objections have been partly overcome by the use of Claude's aneroid manometer, originally devised for determining the pressure of the cerebro-spinal fluid. In this method blood is allowed to flow from the vein through a needle into a rubber tube of 3 mm. bore, the pressure being communicated to the manometer by an intervening column of air. It will be seen from the figure that the apparatus consists of the manometer (E), two pieces of rubber tubing of 3 mm. bore (B and D), separated by a short length of glass tubing (C). An ordinary broad serum needle is attached to the end of the rubber tubing (B) by means of a metal nozzle (A), which fits it accurately. The glass tube acts as a window through which the progress of the column of blood may be watched, and as a means of disconnecting from the manometer that part of the apparatus which requires sterilising. The aneroid manometer is graduated in centimetres of water, giving readings from 0 to 100.



Aneroid manometer. (Supplied by G. Boulitte, Paris.)

Villaret, St. Girons, and Grellety-Bosviel,[7] Leconte and Yacoel [8] in France, and Gazzotti [9] in Italy have made numerous observations by this method both in normal and pathological subjects. As their method appeared suitable for clinical use, we have investigated the results obtained by it in normal individuals under varying conditions as a preliminary to employing it in pathological cases.

Technique (Claude's Method).

The subject lies on his back on a horizontal couch, the head and shoulders being supported by a single pillow. The arm and shoulder must be completely stripped of clothing as the slightest constriction of the limb may artificially raise the venous pressure. It is important that the arm should be comfortably supported and the muscles perfectly relaxed, as tonic muscular contraction impedes the flow of blood along the veins. The tubing (B) carrying the metal nozzle, the glass tubing, and the needle are sterilised in liquid paraffin in a water-bath, and may conveniently be kept ready for use in sterile paraffin. The skin of the arm is sterilised, and the superficial veins at the bend of the elbow are rendered prominent by slight manual compression of the arm. The needle is inserted into a suitable vein in the direction of the blood current and the blood is allowed to flow out for a few seconds till the effects of the stasis have disappeared. The glass tubing having been connected to the manometer, the metal nozzle is now inserted into the needle. As the blood flows from the vein along the tubing the pressure registered by the manometer rises. When the reading becomes constant it is recorded. The nozzle may now be removed from the needle, and after allowing a few drops of blood to escape, it may be replaced and a second reading taken. During the experiment the needle and that part of the tubing containing blood must be kept strictly horizontal and level with the vein, the level of the manometer itself being immaterial. When considerable venous engorgement has been produced in rendering the vein prominent the first reading may be somewhat higher than the second, in which case it should be ignored, and a third reading obtained if possible, the mean of the last two readings being taken. If the needle and tubing are sterilised in liquid paraffin as described, the blood will remain fluid for some time, usually four to five minutes, and at the end of the experiment should drip freely from the needle by gravity.

Position of Arm Relative to Heart Level.—Different observers have placed the arm in different positions, and have taken various points on the chest wall as criteria of heart level. Moritz and Tabora had the arm abducted, slightly bent at the elbow, and pronated, resting on the couch. They adjusted the zero of their manometer to the level of the right auricle, which they took as being 5 cm. below the front of the sternum at the level of the fourth costal cartilage. Under these conditions slight alterations in the position of the arm were not found to affect the reading. Eyster and Hooker, following von Recklinghausen, referred their readings to the mid-point of the antero-posterior diameter of the thorax at the subcostal angle. Lewis corrects his readings to the level of the front of the sternum. The French workers, Villaret and others, place the arm horizontally out from the shoulder in the body plane ("rigoureusement horizontal dans le plan du corps"), by which means, according to them, the hydrostatic factor is eliminated. It appears to us that the exact measurement of the position of a vein relative to the sternum is open to criticism; it is difficult to carry out at the bedside, and owing to the varying shape of the chest in different individuals does not necessarily assure a fixed relation to heart level. It seems equally rational to measure the height of the vein above the level surface on which the subject is lying. For these reasons we have adopted the technique of the French workers, placing the arm horizontal from the shoulder, and supporting it at the elbow on blocks of known height. We find that with the shoulder supported comfortably, the position of the vein relative to the sternum is approximately constant in normal individuals—i.e., 6–8 cm. below the sternum at the angle of Louis or 10 cm. below the subcostal angle. The height of the vein above the couch is usually 11–14 cm. The forearm and wrist must be supported in order to obtain perfect muscular relaxation.

Claude's method has advantages over other direct methods in that the apparatus is portable, the technique simple, the number of parts to be sterilised are few, and there is no necessity to adjust the manometer itself to any particular level, as long as that part of the tubing containing blood is maintained horizontal. Certain criticisms may be offered. Firstly, the manometer must be carefully graduated against a water manometer. We found that, in our instrument, while the higher readings were accurate, the lower readings gave a constant over-estimation, a manometric reading of 15 cm. corresponding to a true pressure of 9 cm. All our readings as given below are therefore corrected from a table constructed by testing Claude's manometer against a water manometer. We can find no mention of correction of the manometric error in the work of the French authors, and this may account for the fact that they obtained somewhat higher readings than we shall record below. Transmission of pressure from fluid to air involves errors due to surface-tension and capillarity. Provided the bore of the tube at the junction of liquid and air is fairly wide—e.g., 3 mm.—this error should not be great, but where the venous pressure is very plained of distressingly frequent and urgent calls to stool, she did not, so far as I could ascertain, pass "too fluid" stools, and more often than not she passed nothing at all. The symptom was, in all probability, due to true rectal or colonic crises. It had been present for many years, but latterly a change in its character had raised the possibility of carcinoma coli. I did not have the opportunity of investigating the matter further.

REFLEX DIARRHŒA.

The following case illustrates a type of diarrhœa which may, I think, legitimately be described under this heading. Cases in which there is an actual appendicular or pelvic abscess should not be included in the same category, for in these the sepsis and peri-rectal inflammation are the more important factors.

A medical man who had had bacillary dysentery during the war started in 1919 to have diarrhœa with frequently recurring exacerbations, associated with much pain of a colicky character, but a complete absence of localising signs. There was pyrexia during the attacks. Various investigations were made with negative result. Several unsatisfactory diagnoses were suggested. No treatment had any effect. A very thorough overhauling in a clinic between attacks was quite unproductive, and in 1922 it was finally decided to perform a laparotomy. A thickened inflamed appendix was removed, which contained about half a cubic centimetre of pus. There has been no return of the attacks since. The appendix was "silent" in so far as the production of symptoms directing attention to itself was concerned, but had produced such definite bowel symptoms as colic and diarrhœa. I would suggest that these symptoms were akin to the reflex gastric symptoms so commonly seen in chronic appendicular disease.

EMOTIONAL DIARRHŒA.

The nervous diarrhœa which I wish more particularly to stress is a functional condition and expresses an anxiety-state, but it is important to recognise that it may develop out of a true irritative or infective diarrhœa. All grades of it are encountered. One individual may have a mere tendency to diarrhœa at the ordinary times of defæcation or on special stressful occasions—as before a viva voce examination; another unfortunate may so far lose confidence in himself and his power to control the activity of his bowel that it becomes impossible for him to go to any social function or to expose himself to any conditions under which self-consciousness is likely to prevail. To have to face the risk of being out of reach of a lavatory on these occasions becomes for him an insufferable anguish. The condition is a visceral neurosis closely akin to nervous bladder frequency. Like stammering and blushing, it is worse on those occasions when it is most important that it should be in abeyance. It is not amenable to wilful control, but rather aggravated thereby. In the treatment sensible explanation and encouragement play an important part, but it is often valuable as a temporary expedient while confidence is being restored to prescribe, in the smallest doses, opium or codeine. When the patient realises that he has a faithful ally in the shape of a minute pill which will carry him through occasions and affairs previously looked upon as insupportable, he has made a decided step towards recovery from his malady, and may happily proceed to the next stage in which it is just as effective to carry the pill in his waistcoat pocket.

FREQUENCY OF THE VARIOUS TYPES OF CHRONIC DIARRHŒA.

With a view to obtaining a rough estimate of the relative frequency of the various forms of chronic diarrhœa seen in this country, I have analysed a recent series of 54 cases. Of these 24 were under my own care. The remainder were patients of Dr. A. F. Hurst, but I had the privilege of seeing most of them with him, and am indebted to him for permission to include them here. The distribution was as follows:—

Diarrhœa of Gastric Origin.—Seventeen cases, or 31 per cent., including six cases of Addison's anæmia, three of alcoholic gastritis, and eight of uncertain pathology. (The high proportion of cases of Addison's anæmia must be regarded as artificial. Without them the remaining cases would show a percentage incidence of 20, and the percentage incidence of other groups would require revision.)

Diarrhœa Originating in the Large Bowel.—Seventeen cases, or 31 per cent., including six cases of ulcerative colitis, four dysenteries, four cases of carcinoma coli, one non-ulcerative colitis, one muco-membranous colic, and one diarrhœa due to constipation.

Diarrhœa Due to Mesenteric Glandular Disease.—Seven cases, or 12 per cent., including three cases of chylous diarrhœa and four of simple diarrhœa, all probably associated with tuberculous glands in the mesentery, though one was possibly a case of cœliac disease.

Diarrhœa Accompanying Cholecystitis.—Five cases, or 9 per cent.

Emotional Diarrhœa.—Four cases, or 7 per cent.

The remaining cases included one each of pancreatic disease (?), gastro-enterostomy, appendicitis, and sprue.

The correctness of the diagnosis cannot be dogmatically asserted in every one of these cases, but all were carefully reviewed, and a large proportion were very thoroughly investigated. Sometimes more than one factor may be at work. I have, for instance, seen a case (not included in this series) in which a relapse of ulcerative colitis was associated with gastritis and achlorhydria, attention being drawn to this by the presence of acne rosacea.

I hope that I have said enough to indicate the great diversity of conditions which may give rise to chronic diarrhœa, and to suggest the methods most likely to be of service in their differentiation. If I have dealt with the question of treatment superficially and briefly it must be my excuse that diagnosis is the beginning and the end of medicine, and the most essential preliminary to rational therapeutics.

In the preparation of the foregoing remarks, which are largely the outcome of casual notes and impressions collected in the past three years, I have been much stimulated by reference to the writings of such old masters of my own school as Bright and Gull; by the perusal of a recent small volume by Prof. Louis Timbal,[9] of Toulouse; and perhaps most of all by my association with Dr. A. F. Hurst, whose knowledge of the subject and whose power of inspiration are equally difficult to measure.

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OBSERVATIONS ON THE VENOUS PRESSURE IN NORMAL INDIVIDUALS.

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To estimate the venous pressure in man two main methods—the indirect and the direct—have been employed. The indirect methods consist in determining the external pressure necessary to produce collapse of a small superficial vein, or the pressure which just prevents refilling of a vein previously emptied by "milking" towards the heart. For details of these methods reference should be made to the papers of von Recklinghausen,[1] Eyster and Hooker,[2] and Sewall.[3] The direct methods consist in accommodate increased volumes of blood without an appreciable increase in internal pressure occurring. This is a point of great practical importance. In seeking to determine increases in venous pressure in heart disease our object is to estimate the degree of venous engorgement. When this is considerable we can easily appreciate it clinically by observing enlargement of the liver and engorgement of the cervical veins. Unless a rise in venous pressure occurs before clinical evidence of venous engorgement is manifest, the determination of venous pressure in cases of heart disease will be of little practical importance. In our own very limited experience of the venous pressure in pathological cases we have not found it raised unless signs of heart failure were present. The French workers, however, maintain that a rise in venous pressure may be the first indication of incipient heart failure. The volume of blood in the veins must also be considered in regard to hydrostatic effects. When the veins are distended at positions below heart level the frictional resistance to the flow of blood will be minimal. On the other hand, at positions above heart level, where the veins are relatively collapsed, the frictional resistance will be maximal owing to the diminished lumen of the vein and the increased velocity of the stream. For these reasons correction of the venous pressure reading to an arbitrary plane is open to objection. It must also be borne in mind that the veins have been shown to contract in response to nervous stimulation, and Henderson[12] has recently attributed considerable importance to the "veno-pressor" mechanism in regulating the volume of venous blood and the venous return to the heart.

Relation of Venous to Arterial Pressure.

According to Villaret and his co-workers, the venous pressure, in normal subjects, in centimetres of water, approximates very closely to the systolic arterial pressure expressed in centimetres of mercury. They attach great importance to this relationship, and are prepared on the basis of the systolic blood-pressure reading in any patient to state what his physiological venous pressure should be, regarding any appreciable variation from this figure as pathological. Thus in certain cases of arterio-sclerosis and hypertension they consider the venous pressure subnormal where it is below the figure demanded by their formula. In all our observations we have recorded the systolic and diastolic pressures, and we have been unable to find any strict relationship between arterial and venous pressures. Thus, in four subjects in whom the systolic B.P. was 135 mm. Hg, the venous pressure readings were 18, 11, 9, and 7 cm. H_2O respectively, and in four subjects with a systolic B.P. of 140 mm. Hg the venous pressure readings were 14·5, 12·5, 11·5, and 9 cm. H_2O.

Venous pressure is dependent on capillary pressure rather than arterial, and capillary pressure is regulated by the condition of the arterioles. We have investigated the effect on the venous pressure of dilating the arterioles with amyl nitrite in six subjects. In all cases the venous pressure rose definitely by several cm. H_2O, the rise running approximately parallel to the rise in pulse-rate. An example of the effect of inhaling 3 minims of amyl nitrite is given below:—

Pulse-rate at 10-sec. intervals.	Venous pressure.	Pulse-rate at 10-sec. intervals.	Venous pressure.
90 ..	6·5	138 ..	9·0
90 ..	6·5	132 ..	9·5
102 ..	6·5	120 ..	10·0
126 ..	7·0	87 ..	10·0
126 ..	—	A* ..	6·5

A* = Reconnect after short interval.

Effect of Respiration on Venous Pressure.

In normal persons respiratory variations in pressure were not observed in the arm veins. In a pathological case where the venous pressure was 30 cm. H_2O, we observed oscillations of ½–1 cm. Excessive ventilation in normal subjects was found to lower the venous pressure by 1–3 cm. H_2O. If intrathoracic pressure is raised by the subject taking a deep inspiration and holding it for as long as possible, a considerable rise in venous pressure can be produced, the degree of rise depending on the depth of the inspiration and the duration of the apnœa.

An example is given below:—

Observation 38. (B.P. 160/70.)

Initial pressure 7 cm. H_2O, rose to 8·5 cm. H_2O.
On holding breath, rose to 25 cm. H_2O.
On releasing breath, fell to 13·5 cm. H_2O.
Final reading 9 cm. H_2O.

We have obtained a rise in pressure by this method in all subjects, and find it a useful means of proving free communication between vein and manometer.

Effect of Exercise on the Venous Pressure.

In six subjects the venous pressure was taken after fairly severe exertion. Care was taken to employ the minimum compression of the arm before inserting the needle into a vein, and the blood was allowed to escape freely before connecting the needle to the manometer. The readings obtained varied from 9·5 to 19·5 cm. H_2O, and in all cases a definite fall was observed after a few minutes, the average fall being 5 cm.

We conclude that a rise of peripheral venous pressure occurs during exercise, which is in agreement with the findings of Sewall and Gazzotti. This rise may be dependent on a raised intra-auricular pressure resulting from increased venous return, or on arteriolar relaxation in the active muscles producing an increased capillary pressure, or on a combination of these two factors.

Summary.

1. The pressure in the arm veins in normal individuals has been investigated by Claude's manometer according to the technique of Villaret, St. Girons, and Grellety-Bosviel. With the subject recumbent and the arm horizontal the readings obtained were between 5 and 15 cm. H_2O in 90 per cent. of cases. Less constant results were obtained than those recorded by other workers with this method.

2. This method involves errors which probably render the lower readings unreliable, but should prove sufficiently accurate for detecting pathological increases in venous pressure. No reading under 15 cm. H_2O obtained by this method should be regarded as pathological. More accurate determination of low venous pressure is possible if the author's modification is employed.

3. The factors responsible for the normal peripheral venous pressure are discussed.

We have to thank Dr. R. A. Young and Dr. J. Strickland Goodall for kindly allowing us to make observations on patients under their care.

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small—e.g., below 5 cm. H_2O—the error may be sufficient to render the reading of little value. A certain error will also occur owing to frictional resistance to the flow of blood through the needle. For these reasons we are not satisfied with the reliability of the lower readings obtained by this method. These errors may be largely overcome by the introduction of a pressure bulb connected by means of a T-piece to the rubber tubing (D), near the manometer. An ordinary 20 c.cm. record syringe fixed to the manometer stand is satisfactory. By regulating the pressure in the air column by means of the pressure bulb, the blood is first allowed to reach the glass tube and then the pressures noted when the column of blood just advances, and when it just reverses and moves towards the vein. The mean of these two readings is taken as the venous pressure. In using this modification an ordinary water manometer may be substituted for the anercid.

Normal Venous Pressure.—We give below the readings obtained by Claude's method in 34 healthy medical students who kindly volunteered to help us in this work.

Pressure in cm. H_2O.	Number of cases.
5 or under	3
5–10	19
10–15	11
15–20	1

It will be seen that over 50 per cent. gave readings from 5–10 cm. H_2O, and approximately 90 per cent. between 5–15 cm. H_2O. If we include certain cases in which the pressure was determined after exercise and allowed to fall to normal, and cases in which we used the modified technique described, a pressure of 5–15 cm. H_2O was obtained in 41 out of 47 cases. The normal venous pressures recorded by other observers are as follows:—

Observer.	Method.	Venous pressure (cm. H_2O).
Frank and Rey ..	Indirect	1–6
Eyster and Hooker ..	,, ...	5–10
Moritz and Tabora ..	Direct	4–8*
Castellotti	,, ...	4–7
Corradi	,, ...	8–13
Villaret and others ..	Claude's man	12–13
Gazzotti	,, ...	13–14

*Extremes 1–9.

Although Claude's method appears to give higher results than other direct methods, it must be borne in mind that if these figures are corrected to the plane of heart level adopted by Moritz and Tabora they would be lower.

Factors Determining Normal Pressure in Peripheral Veins.

It must be emphasised that in measuring the internal pressure in a peripheral vein we are not recording the pressure in the right auricle, even when the vein is carefully placed at heart level. Intra-auricular pressure is said always to be negative, while in any vein outside the thorax a positive pressure is invariably present unless the vein is completely collapsed.

The factors determining the normal pressure in the peripheral veins may be briefly considered as follows: 1. The *vis a tergo* or the capillary pressure. 2. The *vis a fronte* or the negative intra-auricular pressure. 3. The hydrostatic relationship of the vein to the heart. 4. The volume of blood in the veins.

1. *The Vis a Tergo.*—The capillary pressure depends indirectly on the arterial pressure maintained by the left ventricle, and is regulated by the arterioles and possibly by the capillaries themselves. Krogh[10] finds that the capillary pressure is relatively low and varies with the hydrostatic pressure. At and above heart level it remains constant at approximately 4·5 cm. H_2O, while below heart level it is 4·5 plus the hydrostatic pressure. Lewis,[11] from observations on the cutaneous "white line," concludes that the capillaries are capable of exerting a contractile force equal to 50–100 mm. Hg—that is, up to 135 cm. H_2O—and in this way capillary dilatation is avoided at high hydrostatic pressures.

2. *Vis a Fronte.*—This consists in the suction action due to the negative intrathoracic pressure maintained by the elastic recoil of the lungs. This negative pressure will increase during inspiration and decrease during expiration, and normally varies from 8–12 cm. H_2O. Any permanent increase in intra-auricular pressure must ultimately produce a corresponding increase in pressure in the peripheral veins, but owing to the presence of valves it will take an appreciable time for this increase to traverse the gradient from heart to periphery. Thus in normal individuals we have seldom observed respiratory variations in pressure in the arm veins.

3. *Hydrostatic Effect.*—If the veins were a series of rigid tubes without valves the pressure at any point would be directly proportional to the position of that point relative to the heart. As, however, the veins are collapsible tubes freely supplied with valves, simple physical laws may not be too closely applicable. It was noticed by von Recklinghausen, and has been confirmed since, that, in the veins of the foot the pressure falls considerably short of the theoretical hydrostatic pressure. This has been attributed to the "venous pump" mechanism, which is twofold, peripheral and abdominal. Owing to the arrangement of the valves in the peripheral veins muscular contraction will tend to force blood towards the heart. As each segment of vein included between two sets of valves is a potential pump, compression of any segment expels the contents into the more proximal segments. Each time the diaphragm descends with inspiration the blood in the great abdominal veins is driven into the thorax, this force pump action being aided by the increased negative pressure in the thorax during inspiration. Thus the veins in the lower limbs are protected from excessive hydrostatic pressures which would otherwise be produced by the erect posture. It is obvious from these considerations that under normal conditions the peripheral venous pressure must be constantly varying, and it is open to question how far we can use an arm vein as a manometer for the general venous pressure when the arm is kept flaccid at a fixed level. We have studied the effects of altering the level of the arm on the venous pressure as determined by Claude's manometer. Certain practical difficulties arise; it is not easy to keep the muscles relaxed while changing the position of the arm, nor to maintain the needle and tubing in the correct plane. As a result of our observations we can say that invariably raising the arm from the horizontal lowers the pressure, while lowering the arm raises the pressure. We have not been able to satisfy ourselves that the theoretical hydrostatic difference is always realised, but it is possible that we were unable to allow sufficient time for the pressure to stabilise at the new level. On lowering the arm the rise in pressure may exceed the hydrostatic change. We record two examples:—

Observation 64.

Vein 8 cm. below sternum—V.P. = 10 cm. H_2O.
On lowering vein to 19 cm. below sternum—V.P. = 26 cm. H_2O.

Observation 65.

Vein 18 cm. below sternum—V.P. = 34 cm. H_2O.
On raising vein to 5 cm. below sternum—V.P. = 15·5 cm. H_2O.

When a vein is above heart level it does not completely collapse as can be readily verified, and we have recorded positive pressures 5 cm. above sternum level. It seems possible that at positions above heart level the principles which Krogh has applied to the capillary pressure may also be applied to the venous pressure.

4. *Volume of Blood in the Veins.*—It is usually stated that the veins, being widely distensible, can

Expt. 4.—A rabbit which was running a steady titre of 1/2560 to *B. enteritidis* (Gaertner), as a result of injections of killed cultures of this organism given some months previously, was injected intravenously with 0·5 c.cm. of a broth emulsion of a culture of *B. tuberculosis* (bovine). The seventh day after the injection the temperature rose, and on the ninth day it reached 106° F. The animal was obviously ill and died the seventeenth day after the injection. The titre was tested every two or three days, and it remained steady throughout. This experiment was repeated on another rabbit, which lived for four weeks, and the result was similar.

Thus the severe constitutional disturbances which occurred in these two experiments seemed to have no effect on a steady agglutination titre. This result was expected in view of the work of Topley, Imrie, and Platts,[5] who have reported the results of various repeated agglutination tests on inoculated subjects suffering from pyrexia due to various causes other than enteric.

Summary.

Various non-specific antigens were used in an attempt to influence a steady agglutination titre in rabbits. The only instance in which the titre was appreciably affected was when the non-specific antigen bore close serological relationship to the specific one.

A steady agglutination titre remained unaffected by severe constitutional disturbances occurring as the result of infections artificially produced.

These results are evidence in support of the reliability of the repeated agglutination method as a means of diagnosis of enteric in the inoculated subject.

In conclusion, I should like to thank Dr. H. Fielden for his kind help in immunising the rabbits, and Dr. A. R. Berrie for his assistance throughout.

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GLANDULAR ACTIVITY IN THE HUMAN FŒTUS.

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IT is well known that the function of certain organs becomes established before birth, but the date at which they first become active is still in many cases obscure. It is not always easy to determine whether a gland or organ is functionally active or not, and, moreover, the elucidation of the problems connected with such activity in the fœtus is rendered the more difficult in that an organ may play a part during development different from that which it does in the adult; further, the transition from one function to the other is probably gradual. It must also be remembered that demonstration of the presence of a secretion in a gland does not of necessity mean that the gland is functionally active, neither does the apparent absence of secretion always indicate the reverse. It is only by examining the evidence obtained from all sources that it is possible to reach conclusions as to the activity of an organ. Although our observations are as yet incomplete, some interesting data have been collected which throw light on this subject, and which seem worth recording.

The glands may be conveniently divided into those belonging to (*a*) the excretory system, (*b*) the alimentary system, and (*c*) the ductless system.

Excretory System.

(1) *Kidney.*—It has long been recognised that the kidney is functional at birth, but the time when it first becomes active has hitherto been very obscure.

(*a*) *Histological Evidence.*—We have recently reported [1] the results of histological investigation of this point. A staining method was devised whereby differences in the H-ion concentration of the cells could be detected as shown by the differential staining of the cytoplasm in the various parts of the tubule. Staining with Scott's hæmatoxylin and Biebrich scarlet following formol-acetic-Muller fixation caused the cells of the convoluted tubules to appear a bright salmon-pink (acid reaction), whereas those of the straight tubules took on a pinkish-purple colour (alkaline reaction). The kidneys of fresh fœtuses of all ages were examined by this method, and the differential staining was obtained in all fœtuses from 12 weeks maturity upwards, but not at 9 weeks or 8 weeks. From the observations of Trevan [2] it would appear that NaH_2PO_4 is specifically excreted by the tubule cells, and it is probable therefore that the first appearance of the staining reaction in these cells depends on the beginning of such excretion. We conclude that the fœtal kidney is certainly functioning by the twelfth week of development, and quite probably as early as the tenth week.

Further histological evidence is forthcoming in that many glomeruli, capsules, and tubules are well developed by 6–7 weeks. The epithelium of Bowman's capsule is found to be cubical in the more newly-formed glomeruli near the surface, whereas in the deeper glomeruli it is flattened even in specimens of 11 weeks. Is it possible that this indicates the presence of fluid in the capsule and tubule even at this early age?

(*b*) *Chemical Evidence.*—A small quantity of urine was obtained from a full-term fœtus, and tested for kreatinin; it was found to contain 0·0779 g. per 100 c.cm. We were fortunate in securing two samples of fresh amniotic fluid, which, in view of its possible excretory function, were tested for urinary constituents. Analysis gave the following results:—

Per 100 c.cm.	Full-term.	32 weeks.
Urea	0·004 g.	0·156 g.
NH_3	0·023 g.	0·0075 g.
Albumin	Not tested.	0·25 g.
Spec. gravity ..	,,	1008
Kreatinin	,,	0·01 g.
Cl', SO_4'', PO_4'' ..	,,	All present.
Uric acid	,,	Absent.
Bile salts	,,	Absent.

(2) *Liver.*—The excretory function of the liver appears to be established early, as well-formed bile-ducts are present in the 12-week fœtus. Pigment can be seen in the intestinal contents at an even earlier date.

Alimentary System.

The various digestive enzymes were tested for * at different stages of development. In the 16-week fœtus pepsin is present in the gastric mucosa, and the pancreas contains both trypsin and trypsinogen, whereas pancreatic lipase and amylase are absent, and no intestinal enzymes are present. By the twenty-fourth week pancreatic amylase can be detected and the trypsinogen has greatly increased in amount. At 32 weeks intestinal enzymes are still absent, but pancreatic lipase is now present in small amount. At full term active trypsin and trypsinogen are both present in the pancreas; the intestinal enzymes have not as yet been tested for. It is remarkable that no HCl has been found in the stomach, even at full term, although pepsin appears as early as the sixteenth week. Mucin is evidently produced early as fully developed goblet cells are present in the intestine, at 8 weeks.

The Ductless System.

(1) *Pituitary.*—The pituitary of an 11-week fœtus shows well-marked histological differentiation and the pars anterior is extremely vascular. The cells of this part show a definite vesicular arrangement and some acidophil colloid-like material is sometimes present.

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* We are indebted to Miss D. Woodman, B.Sc., for the carrying out of the enzyme tests.

A NOTE ON THE EFFECT OF INOCULATION OF HETEROLOGOUS ANTIGENS

ON A STEADY AGGLUTINATION TITRE, WITH REFERENCE TO THE DIAGNOSIS OF ENTERIC IN INOCULATED SUBJECTS.

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The diagnosis of enteric fever on the result of a single agglutination test is no longer considered reliable unless certain conditions are fulfilled. This is due to the fact that there is a fairly large percentage of the population[1] who agglutinate one or more of the various members of this group of micro-organisms, either naturally or as the result of protective inoculation.

In order to establish a diagnosis with any degree of certainty, it is necessary to employ the method of repeated agglutination tests, and thus demonstrate that well-marked fluctuation in agglutination titre which is considered characteristic of enteric infections. During the war a certain amount of evidence accumulated in favour of the reliability of this method of diagnosis, but from some quarters it was subjected to considerable adverse criticism. Garrow[2] in 1920 called attention to an early paper by Dreyer and Walker[3] on the production of immune substances, in which they found that *B. coli* agglutinins produced in rabbits by inoculations of *B. coli* vaccine could be increased by the injection of killed cultures of staphylococci or streptococci or the bacillus of Friedländer. On theoretical grounds, Garrow assumed then, with a considerable degree of justification, that infections which have no relationship to enteric might sometimes increase the production of specific agglutinins in the immunised subject, thereby giving rise to errors in diagnosis by this method. If this non-specific stimulation of agglutinins were at all gross, and were to occur with any frequency, it would in all probability destroy the value of the repeated agglutination method as a means of diagnosis, and the object of this investigation is to see to what extent it is possible to influence a steady agglutination titre in rabbits by the injection of non-specific antigens.

Technique.—Record of Experiments and Commentary.

Dreyer's technique has been used, and the tubes were incubated for two hours at 55° C. The dilutions were put up in geometrical series, starting at 1/20 and doubling the dilution in each succeeding tube, and the last tube to show any agglutination visible to the naked eye was taken as the end-point.

Expt. 1.—As the result of an intraperitoneal inoculation of *B. coli* vaccine into a rabbit, agglutinins to this organism were formed. The sixteenth day after the injection the titre was 1/640, and by the twenty-first day it had fallen to 1/80. Two and six days later the titre was exactly the same, and therefore had apparently become steady. The animal was then given 3 c.cm. of a 24 hours' broth culture of *Staphylococcus aureus*, killed by heating for half an hour at 60° C., into the peritoneal cavity. The serum was tested on the first, second, third, fourth, fifth, sixth, seventh, eighth, and eleventh day after this inoculation, and the titre in each case was 1/80. The titre therefore remained unaffected by the non-specific inoculation.

This experiment is to all intents and purposes an exact replica of one of Dreyer and Walker's experiments, in which they demonstrated a 250 per cent. fluctuation occurring the third day after the staphylococcal injection. The only important difference in technique is the fact that their sera were all stored on ice until the end of the experiment and then tested, whereas in this case the titres were ascertained a few hours after the blood was drawn. It is true they were putting up their dilutions in an arithmetical series and therefore would be more likely to detect slight fluctuations in titre, but an increase of 200 per cent. or more would be easily established when using geometrically increasing dilutions; and furthermore, unless the fluctuation reaches this magnitude, it is not considered of diagnostic importance when carrying out repeated tests. This experiment was then repeated (on another rabbit) using 1 c.cm. of a thick emulsion of sheep's red corpuscles for the non-specific injection. The hæmolytic titre rose to 1/40,000, but the agglutinin titre remained steady. If one could raise a titre 200 per cent. or more by a single non-specific injection, one would expect a larger response than this by continuing the process and giving increasing doses, and therefore a rabbit with a steady agglutination titre to *B. paratyphosus* A was given many massive doses of non-specific antigens. The result will be seen in the following experiment:—

Expt. 2.—The agglutination titre of a rabbit's serum to *B. paratyphosus* A was 1/640 eight months after intravenous inoculation of a vaccine prepared from this micro-organism. It then received 11 doses of non-specific vaccine as stated below. The doses were given intravenously with an interval of seven to ten days between the injections.

No. of injection.	Rosenow's vaccine.	Gonococcal vaccine (millions).	*B. coli* vaccine.
Dose 1	= 0·25 c.cm.	+ 500	Nil.
,, 2	= 0·5 c.cm.	+ 500	,,
,, 3	= 1·0 c.cm.	+ 1000	,,
,, 4	= 1·0 c.cm.	+ 1000	+ 500 mill.
,, 5	= 1·5 c.cm.	+ 1000	Nil
,, 6	= 1·25 c.cm.	+ 1000	,,
,, 7	= 1·00 c.cm.	+ 1000	,,
,, 8	= 1·0 c.cm.	+ 1000	+ 500 mill.
,, 9	= Nil.	1500	+ 1000 ,,
,, 10	= 1·0 c.cm.	= 1000	+ 1000 ,,
,, 11	= Nil.	1500	+ 1000 ,,

Note.—1 c.cm. of Rosenow's vaccine contains:—

D. pneumoniæ, type 1	500 million.
,, ,, 2	750 ,,
,, ,, 3	500 ,,
,, ,, 4	1250 ,,
Streptococcus (*hæmolyticus*)	1000 ,,
B. influenzæ	500 ,,
Staphylococcus aureus	500 ,,

The animal's serum was tested every four to five days, and in no case showed more than 100 per cent. fluctuation in titre. The fourth and fifth days after the last injection of these massive doses of vaccine, the titre to *B. paratyphosus* A was 1/1280—i.e., 100 per cent. higher than it was before the non-specific inoculations were started.

Dreyer and Walker have noted that the repeated withdrawal of blood tends to raise an agglutinin titre, and therefore it is quite possible to explain a slight increase of this nature on this basis. An experiment was then tried to see if the injection of an organism such as *B. paratyphosus* B would raise a steady titre to *B. typhosus*, as these two organisms are nearer in relationship to each other than *B. coli* and *Staphylococcus aureus*, which have nothing in common. The result was entirely negative, and it was only when two organisms having very close serological relationship such as *B. paratyphosus* C and *B. paratyphosus* B were used, for the primary and secondary inoculations respectively that the primary titre was carried up. In this case the titre to *B. paratyphosus* C was raised from 1/320 to 1/5120 in seven days as a result of the inoculation of *B. paratyphosus* B. In view of the results obtained by Andrewes[4] (1922) it may be noted that the bacterial suspensions employed in this experiment had not been differentiated as specific or non-specific.

Thus it is apparent that with this exception it was found impossible to produce anything more than a slight fluctuation (quite within the margin of experimental error allowed for these tests) in a steady agglutination titre by the injection of killed non-specific antigens. It was then thought advisable to see whether severe, constitutional disturbances would have any effect on a steady titre.

Expt. 3.—A rabbit was immunised to *B. paratyphosus* A and four months later the titre of its serum to this organism was 1/320. It was then injected intravenously with 1/20 c.cm. of a living broth culture of *Pasteurella muris*. The temperature shot up to 107° F. the day after the injection, and the following day it was 100° F. The third day after the injection the animal died after an extremely acute infection. The titre was tested daily, and did not show more than 100 per cent. fluctuation.

A CASE OF “CONGENITAL” OCCLUSION OF THE COMMON HEPATIC DUCT

IN A TWIN BABY,

WITH AN INDIRECT VAN DEN BERGH REACTION.

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Cases of obstruction of the bile-passages in young infants are sufficiently rare to deserve recording, but the case reported here is probably unique in the literature because it presents two features which have important bearings on the pathogenesis of jaundice as well as on the ætiology of the obliteration of the bile-ducts in infants.

T. W. D., a male infant, 8 weeks old, was brought to the out-patient department on Jan. 11th, 1924, on account of jaundice, and was admitted under my care.

History.—The child was one of binovular twins. His birth-weight was 7½ lb. He was breast-fed for two weeks, but was then weaned on account of vomiting and was put on dried milk. His colour was perfectly normal until he was 3 weeks old, when he began to be yellow. The umbilicus had been discharging at this time. The jaundice then increased gradually until the child became bright yellow all over, when he was brought to hospital. He vomited a little after each feed and bled from the nose when he screamed. The stools had been of putty colour and hard since the onset of jaundice. The twin sister was quite healthy. The mother had nine other children (all of whom, with the exception of one who died of meningitis, are alive and well) and never had miscarriages or abortions. The father had been treated for “purpura.”

Progress.—On admission, the child was well nourished and weighed 10 lb. 5 oz. The jaundice was very pronounced and the urine deeply coloured. It, as well as the blood, contained an excess of bile-pigment, but the stools were acholic. Constipation was marked. There was a small umbilical hernia and a few palpable glands in neck and groin. The lower margin of the liver reached to about 2 inches below the costal margin, but the spleen was not enlarged. There were no signs of congenital syphilis and the Wassermann reaction was negative. The fragility of the red blood corpuscles was not increased. The van den Bergh reaction was carried out by Dr. Arthur Davies, pathologist to the hospital, who reported that “the blood serum gave a perfect indirect reaction,” pointing to non-obstructive jaundice. The child seemed to progress favourably for the first ten days, taking its feeds of 3 oz. of equal parts of cow's milk and water with only occasional vomiting, and its temperature kept normal except for an occasional evening rise to 99° F. On the eighteenth day the infant became suddenly worse, the temperature rose to 102° and remained high for about five days, when it began to fall gradually till the day of death, on Feb. 5th—i.e., 25 days after admission—from emaciation and collapse. The highest temperature was 103·2°. Its weight at death was 8 lb.

Post-Mortem.—The liver was large and greenish-yellow, firm in consistency and smooth on the surface. There was no naked-eye evidence of fibrosis. There was no gall-bladder or cystic duct. The two hepatic ducts were seen, but appeared to be small in size and to have thicker walls than normally. The viscera were examined for the common bile-duct and its opening into the duodenum, without success. All the other viscera, spleen, &c., appeared to be normal.

It was quite clear from the history, the choluria, and the fæcal acholia, that the case was not one of ordinary, so-called physiological icterus neonatorum. The absence of jaundice in the other children or near relatives showed that it was not a case of the grave type of familial jaundice. The absence of any history of syphilis in the parents, the health record of the patient's numerous sisters and brothers, and the negative Wassermann reaction in the patient's serum practically certainly excluded syphilitic hepatitis. Septic jaundice could similarly be excluded, for although there had been a discharge from the navel there were no signs suggesting direct relationship between it and the jaundice. Buhl's disease (acute fatty degeneration of the newborn) and Winckel's disease (cyanosis afebrilis icterica cum hæmoglobinuria) could also be excluded. The history of “purpura” in the father suggested hæmolytic or acholuric family jaundice, but the urine and fæces and the normal fragility of the red cells excluded this. The diagnosis, therefore, rested between obstructive jaundice due to obliteration of the bile-passages or possibly gall-stones,[1] and the so-called non-obstructive or catarrhal jaundice. The late onset did not exclude “congenital” obliteration, but it made one incline rather to “catarrhal” jaundice, which though extremely rare in infants has been described by Raudnitz[2] and Lovett Morse,[3] and the result of the van den Bergh reaction was, according to the latest theory of jaundice, certain evidence in favour of catarrhal or non-obstructive jaundice. The post-mortem findings, however, showed that this was misleading. This is a point of very great clinical interest and importance. In the theory of jaundice suggested by McNee[4] it is claimed that bilirubin is not formed by the polygonal glandular liver cells, but in the reticulo-endothelial cells of the spleen and Kupffer cells of the liver, and in its passage through the glandular cells of the liver to the bile-passages is modified in some way. Bilirubin so modified—e.g., gall-bladder bile—gives the direct van den Bergh reaction. Bilirubin that has not passed through the glandular liver cells—e.g., in hæmorrhagic effusions—gives an indirect reaction only. Clinical observations by various authorities, including McNee[5] have so far agreed that in all cases of complete obstruction in adults a direct reaction is always obtained, whilst in true hæmolytic jaundice, it is always of the indirect type. It is further claimed that in cases where there is both damage to the polygonal liver cells and obstruction in the bile-passages, both the direct and indirect reactions have been obtained—biphasic reaction. In the case recorded above one should theoretically have expected either a direct reaction, or possibly a biphasic one. The fact that a definitely indirect reaction was obtained shows clearly that the test, as a clinical method of differentiation between the obstructive and non-obstructive types of jaundice, is not as reliable as has been claimed.

Concerning the pathogenesis of obliteration of the bile-ducts in infants, on embryological grounds, it cannot be a true aphasia or lack of development, since the bile-ducts and liver develop as an outgrowth from the duodenum and hence there can be no liver without a bile-duct. The theory put forward by Rolleston[6] is that the obliteration is due to “inflammation of the biliary passages, the result of prenatal absorption by the fœtus of toxins coming from the mother.” However plausible this theory may be in the cases of obliteration hitherto recorded it is untenable here, because the fellow twin is perfectly normal. My own view is that the obliteration in this, and probably in all the other cases in which the jaundice is not evident at birth or within a couple of days after birth, is due to *postnatal* toxic absorption from the navel. It is for this reason that I have in the title of this paper modified the word *congenital* by means of inverted commas. I suggest that in future the word *congenital* be omitted altogether when cases of occlusion of the bile-ducts in infants are described.

I am indebted to Dr. Arthur Davies for the biochemical investigations.

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At this age most of the cells are basophil, but acidophil cells can already be distinguished; as development proceeds the latter become much more numerous and by 30 weeks they present under a low magnification a striking picture when stained with Biebrich scarlet. At full term all parts of the gland appear fully developed.

We have tested for the presence of active principles, using the melanophore reaction described by Hogben and Winton.[3] The test is carried out as follows: An extract of the whole fresh gland is made in 0·6 per cent. NaCl and the resulting solution injected subcutaneously into a yellow frog; expansion of the skin melanophores and consequent darkening of the frog's skin indicates the presence of pituitary hormone. This reaction was obtained quite markedly, even with the gland of a fœtus of 8 weeks.

(2) *Thyroid.*—Although the chief functions of this gland are well known it is extremely difficult to devise a method whereby to test for the active principles of the organ outside the body when only very small quantities of material are available. The evidence that we can put forward for the gland is therefore almost entirely histological.

(*a*) *Histological Evidence.*—Functional activity in the thyroid is regarded as being shown by the following features: (1) A vesicular epithelium of cubical or columnar cells, granular, and with a large spherical nucleus; (2) a rich blood supply; (3) the presence of lightly staining acidophil colloid, usually showing vacuolation at the periphery. The full-time fœtal thyroid appears to be actively secreting as judged by these points. It is, however, not uncommon to find signs of post-mortem change even in apparently fresh material, the change in some cases attaining to complete desquamation of the vesicular epithelium and disappearance of colloid. From an examination of the history of these cases it has been found that there has been almost always either a very prolonged labour or a condition of maternal toxæmia. It is known that the thyroid is stimulated by alimentary toxæmia (McCarrison),[8] and it may be that the toxic condition of the mother or the extreme congestion of the fœtus caused by prolonged labour may induce an unstable condition in the fœtal thyroid, so that post-mortem changes set in much more rapidly than usual. An examination of younger fœtal thyroids shows that some material, staining like the colloid, is present in the vesicles even at 11 weeks maturity; the vesicles are small, but the cells appear to be actively secreting, and the gland is extremely vascular.

(*b*) *Other Evidence.*—The presence of iodine as indicating the active principle of the gland, has been shown by Fenger [4] to be present at least during the last three months of intra-uterine life. From examination of the staining of the colloid, Livini [5] states that the thyroid cells become active when the embryo is between 62 and 66 mm. in length. We have endeavoured, hitherto unsuccessfully, to devise a method of testing for the thyroid active principles based upon their effect on metabolic rate, since the method of Gudernatsch of feeding tadpoles is not here practically applicable.

(3) *Parathyroid.*—Werelius [6] states that this gland probably does not function before birth, but in this investigation we have found the gland at 20 weeks presenting an appearance similar to that of the fully developed gland, with granular cells arranged as in the adult, and a rich vascular supply with large perivascular lymphatics.

(4) *Thymus.*—In the fœtus of 8 weeks cortex and medulla are already distinguishable, and chromaphobe epithelial cells (the precursors of Hassall's corpuscles) can be seen. At 12 weeks typical Hassall's corpuscles are found, although very few in number. The function of this gland is still a matter of controversy.

(5) *Suprarenals.*—The interpretation of the histological appearance of the gland at various stages of its development is by no means easy, and it is hoped to make a separate communication on this point at an early date. Meanwhile the following observations are of interest.

(*a*) *Chromaphil Reaction.*—The gland was tested for the presence of chromaphil material by Ogata's[7] potassium bichromate method, and also by the routine formol-acetic-Muller method of fixation. We have not yet obtained this reaction at all satisfactorily with early fœtal suprarenal glands or fœtal sympathetic ganglia, although a few cells usually give the reaction even at 25 weeks.

(*b*) *Lipoid Reaction.*—Sections of the formol fixed gland were tested for the presence of lipoids by the Sudan III. method of staining: (1) Medulla: At 16 weeks a few cells are found to contain lipoid, and from 32 weeks up to full term and for at least 36 weeks after birth there is a well-marked staining of the medulla cells. This reaction was absent in two cases of anencephaly examined and also in one of osteogenesis imperfecta. (2) Cortex: No lipoid was found in the cortical cells at 16 weeks. From 22 weeks onwards the cells of the middle zone show some vacuolation, and by 32 weeks a very intense Sudan III. staining is obtained in both the outer and the inner zone. This staining was also obtained in the cases of anencephaly and osteogenesis imperfecta mentioned above. In the few postnatal suprarenals which we had the opportunity of observing, the lipoid reaction of the cortex varied very considerably, but as no history as to cause of death was obtained the significance of this is not clear.

(*c*) *Physiological Test for Adrenin.*—The following tests for adrenin were most kindly carried out for us by Prof. F. Ransom. A 10 per cent. extract of the fresh whole gland was made in Ringer's solution, and its action tested on frogs: (*a*) On the peripheral circulation by perfusion; (*b*) on the heart beat by perfusion; (*c*) on the skin glands by subcutaneous injection; (*d*) on the enucleated eye by immersion. By this means the presence of a small but definite amount of adrenin was detected in the glands of fœtuses of 16 and 18 weeks maturity (younger glands have not as yet been tested), whereas the older glands contained a greater quantity. This bears out the observation of others that the presence of adrenin does not necessarily mean that a chromaphil reaction can be obtained in the cells.

Summary.

In conclusion, we wish it clearly to be understood that, although the dates mentioned are the earliest at which any appearance of function has been noted by us, it is quite possible that further investigation may show that these organs become active at yet earlier stages in the development of the fœtus.

1. The fœtal kidney begins to function at about the eleventh week of development. 2. The fœtal liver is functioning as an excretory organ at 12 weeks. 3. The fœtal gastric mucosa contains pepsin at 16 weeks, but no HCl even at full term. 4. The fœtal pancreas contains both trypsin and trypsinogen at 16 weeks; both are also present at full term. Pancreatic amylase is present at 24 weeks, and pancreatic lipase at 32 weeks. 5. Intestinal ferments are not present at 32 weeks, but enterokinase is present at 16 weeks; mucin is present at 8 weeks. 6. The fœtal pituitary contains an active principle at 8 weeks. 7. The fœtal thyroid is producing colloid-like secretion at 11 weeks. 8. The fœtal suprarenal contains adrenin at 16 weeks, but does not give a chromaphil reaction until very much later.

We offer our sincere thanks to all who have kindly supplied us with fœtal material. The expenses of this research have in part been met by a grant from the Thomas Smythe Hughes Medical Research Fund, and one of us (E. E. H.) has to thank the Medical Research Council for a part-time grant.

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The infection had spread into the right kidney and the liver, producing in each of these organs a single large lesion consisting of multiple nodules, many of which had broken down in the centre and in some cases contained pus. Very few streptothrix granules were visible in these lesions. The mesenteric glands were somewhat enlarged and of a yellowish colour, but no granules were found in them. A number of small lesions, more numerous on the right side, were found scattered throughout both lungs; the majority of these were irregular in shape and firm in consistence, but a few contained pus. A small abscess containing actinomycotic granules was present in the spleen. No foci of infection were observable elsewhere in the body. The spleen was enlarged and showed advanced hyaline degeneration; a slighter degree of this form of degeneration was found in the kidneys, but none in the liver, which had undergone fatty degeneration. On microscopical examination sections of the lesions presented the usual appearance of granules embedded in a cellular zone with fibrous tissue at the periphery.

The Organism.

Granules for examination were obtained from the sinuses in the thoracic wall and from the sputum; post-mortem, sections of granules were seen in preparations made from the affected organs. Cultures were obtained from material discharged through the thoracic wall. The granules as seen in the pus and sputum consisted of masses of slender mycelial filaments, many of which were so short as to simulate bacilli. Branching was seen in a few instances. The filaments were Gram-positive and for the most part were evenly stained by this method, but a few threads were irregularly stained and presented a dotted appearance. No spores were seen in preparations from the pus. The presence of clubs was not demonstrated. The organism was not acid-fast. Granules from the pus were inoculated in broth and on the surface of glycerine agar and of Dorset's egg medium; stab cultures were prepared in glucose agar. In the primary cultures no growth of a streptothrix was obtained in the tubes incubated aerobically, all of which contained staphylococci; under anaerobic conditions the streptothrix grew in all the media inoculated, growth becoming visible about the fourth day. The organisms failed to thrive in subcultures. On the tenth day the surface colonies were greyish-white, heaped up, coherent; the majority were circular in outline. Fragmentation seems to have occurred in all the colonies; the appearance of the films was that of somewhat sinuous rod-segments with here and there a longer thread sometimes showing branching. In many individuals one end was swollen and contained a spore. Films prepared from the broth cultures presented similar appearances, and in an agar suspension culture examined as late as the seventeenth day no spores were found. Here the colonies were cream-coloured and irregular in shape.

The organism appears to show the main characteristics of the *Actinomyces bovis* as described by Wolff and Israel,[2] Homer Wright,[3] and Colebrook.[4] The filaments would seem to have been shorter than those usually described; this feature was particularly striking in preparations from the cultures. Israel and Wolff noticed a tendency for the organisms examined by them to assume a bacillary form on artificial media. Referring to the streptothrices in general Foulerton[5] draws attention to a tendency to the appearance of fragmentation and of spore formation on artificial media. It is not surprising, therefore, that these degenerate forms should be present in cultures examined as late as the tenth day.

We are indebted to Dr. F. G. Chandler and Dr. S. Roodhouse Gloyne for permission to publish the records of this case, and to Mr. A. W. Smart for preparing the sections for microscopical examination.

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Clinical and Laboratory Notes.

THE PANCREAS OF TELEOSTEAN FISHES AND THE SOURCE OF INSULIN.

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IT is well known that in teleostean fishes there is a more or less complete separation of the islets of Langerhans from the zymogenous tubules of the pancreas. This was pointed out years ago by Diamare, Rennie, and Vincent and Thompson.

Soon after the announcement by Banting, Best, Collip, and Macleod of the successful preparation of pancreatic extracts containing insulin, Macleod[1] turned his attention to the pancreas of teleosts in order to determine whether the active substance is in fact derived from the islets, or whether it may be obtained from zymogenous tissue and islet indiscriminately—that is to say, from the pancreas as a whole. He found that potent insulin preparations could be made from separated islet tissue of Lophius and Myoxocephalus. He failed to prepare any insulin from the pancreatic tissue proper (zymogenous or acinar) of Lophius, Myoxocephalus, or Zoarces. His conclusion was that insulin, as its name implies, is derived from the insular and not the zymogenous tissue of the pancreas.

At the outset it was suspected that the "islets" of the above-named species do not consist absolutely of islet tissue, but contain a certain amount of acinar material. It was also by no means certain that the somewhat elusive pancreas of teleosts was entirely free from islets. The degree of concentration of insular material into the "principal islets" varies within very wide limits. For this reason, and for the reason that considerable amounts of insulin were obtained[2] from, for example, submaxillary gland and other tissues, it was thought desirable to re-investigate the matter, using the method of Dodds and Dickens.[3] This method is particularly applicable to small quantities of material.

With this object we worked for a week in the laboratory of the Marine Biological Station at Plymouth. The two species investigated were *Lophius piscatorius* and *Myoxocephalus bubalis*. In the majority of specimens of both these species it is not difficult to obtain separately a fair amount of "principal islet" and of mesenteric zymogenous pancreas. Roughly speaking, the islet tissue has been found to yield six or seven times the amount of insulin obtainable from the same weight of zymogenous tissue. But it must be pointed out that our results differ from those obtained by Macleod in one important respect, for whereas he obtained no insulin whatever from zymogenous tissue we have found a very appreciable amount—enough, indeed, to produce definite symptoms of hypoglycæmia when tested upon rabbits in the usual way. This difference may probably be explained partly by the difference in the method of extraction, and partly by the precaution which we have taken to employ perfectly fresh material. With less fresh material, the amount of insulin obtained from zymogenous tissue was appreciably less. The main result of our investigation is, however, entirely confirmatory of that of Macleod.

It was found by Vincent and Thompson[4] in several lake and river teleosts that the "principal islet" was always permeated by strands of zymogenous tissue. Whether this is true in marine teleosts we cannot say until our histological material has

A CASE OF ACTINOMYCOSIS.

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THE subject of this report was by occupation a tram-washer (previously a groom), aged 27, and was admitted to hospital on April 13th, 1923, complaining of a dull pain in the right side of the chest and a swelling over the ribs on the same side. The pain commenced three weeks before admission, and was severe and periodic in character for one week, after which it subsided to a persistent dull ache, and at the same time the swelling appeared on the right postero-lateral aspect of the chest, gradually increasing in size to about 5 inches long and 3 inches wide. There was slight cough and a trace of sputum.

Previous Health.—At the age of 5 he suffered from tuberculous caries of the spine and was treated by rest for 18 months. On Nov. 17th, 1922, he underwent an operation in the Hackney Infirmary for acute appendicitis. Dr. W. Brander, the medical superintendent, has kindly supplied the following information regarding the operation:—

> The patient was suffering from perforation of the appendix with general peritonitis. Our clinical notes state that the inflammation was limited to the terminal part of the appendix, which was perforated and sloughing at the tip. The peritoneal cavity was drained by a tube in the pelvis and by another in the renal gutter. There was no collection of pus, but a general peritonitis. The wounds had healed completely by Dec. 16th.

The patient attended the tuberculosis dispensary at this hospital on March 28th, 1923, and we are indebted to Dr. H. T. Howell and Dr. H. F. Hamilton for the following information:—

> He complained of a cough and sharp pains, aggravated by breathing, in the right side of the chest. Marked angular deformity of the spine in the upper thoracic region was observed. At the right base the percussion note was impaired, the breath sounds were feeble and were accompanied by sharp crepitations. No tubercle bacilli were found in the sputum, and the temperature was 98·8° F. He again attended the dispensary on April 13th, 1923, when a definite swelling, markedly tender, was found on the right postero-lateral aspect of the chest, extending from the inferior angle of the scapula to the tenth rib.

The patient was admitted to the hospital on the same day. On admission temperature was 99·8° F., pulse 120, and respirations 30. The patient was pale and rather wasted. There was some coarse clubbing of the fingers. The teeth were sound, the tongue clean, and the naso-pharynx normal. There was no tenderness or rigidity of the abdominal wall, and the liver and spleen were apparently normal in size.

The percussion note, vocal resonance, and fremitus were distinctly impaired over the base of the right lung, both anteriorly and posteriorly; no breath sounds were audible. Crepitations were detected over the left, but not over the right base. X ray examination showed diminished excursion of the right diaphragm and suggested the presence of a localised abscess at the right base. No lesion of the ribs was detected. There was evidence of old tuberculous caries of the fourth and fifth thoracic vertebræ, but none of active disease. The leucocyte count was 7700 per c.mm. Neither tubercle bacilli nor actinomyces were found in the sputum. The Wassermann reaction was negative.

On the day after admission it was found that the swelling had disappeared, but that there was still marked tenderness over the area. Two days later, however, the swelling reappeared, and during the next week became inflamed and the surrounding skin indurated, with some central fluctuation. On May 9th, 1923, it was incised, some pus containing greyish-white granules evacuated, and the cavity explored. No connexion with the pleural cavity could be found. A tube was inserted for 48 hours. The pathologist reported the presence of actinomyces in the pus. After the tube had been removed, there developed a persistent sinus discharging moderate quantities of pus containing the greyish-white granules. A larger area of the surrounding skin became inflamed and indurated, the subcutaneous induration occupying a wider area than that of the reddened skin, and after two weeks a second sinus had developed below and 2 inches to the left of the original sinus. A few weeks later a third and smaller sinus developed. As time went on the pus became less granular in appearance, but did not diminish in quantity.

In June, 1923, the general condition of the patient had improved considerably. The temperature was normal. there was no sputum, and the weight, which had gradually been decreasing, had become stationary. In July, however, he commenced to lose weight, and to have profuse night-sweats. The temperature became remittent and irregular. At first the morning temperature was higher than the evening reading, but after three weeks this was reversed. From this time the patient steadily became worse, the temperature more and more irregular, and the pulse more rapid. On Sept. 16th a rigor occurred lasting for ten minutes, and another two days later. There was no rise of temperature on either occasion. Actinomyces were found in the sputum for the first time on Oct. 5th. About this time he began to have slight diarrhœa, which gradually became more severe. In the fæces some filaments resembling mycelium were found, but the actinomyces was not definitely identified. The urine on many occasions was found to contain a large proportion of albumin, but there was unfortunately no special examination for actinomyces.

After the onset of severe diarrhœa the patient wasted rapidly, and the tongue and buccal mucous membrane became ulcerated. The ulcers were small, circumscribed, and shallow, and were situated mainly at the sides of the tongue and the corresponding buccal surfaces of the cheeks. The remaining mucous membrane of the tongue was red and glazed.

During the last ten days of the illness ascites and œdema of the feet and ankles supervened. Death occurred on Dec. 14th, after the patient had been under observation for eight months.

Treatment.

Surgical.—The abscess was incised, curetted, and drained, and the wound dressed with a solution of iodine one part, potassium iodide two parts, and water 300 parts. When the surrounding skin and subcutaneous tissue became reddened and indurated a dressing of ung. ichthyol (10 per cent.) was applied. This prevented the zone of inflammation from extending.

Medicinal.—From the outset gradually increasing doses of potassium iodide were given, until a maximum of 180 gr. per diem was reached, and this was continued for several months. With the exception of a period in June, when the patient's general condition had improved, there was no evidence that the administration of iodides had any marked beneficial effect. Later, gradually increasing doses of French tincture of iodine were given until a maximum of 120 minims per diem was reached.

Vaccine.—Subcutaneous injections of multivalent actinomyces vaccine with an initial dose of 1,000,000 mycelial fragments were commenced on Sept. 24th, and continued every five days, with an increase of 1,000,000 at each injection, until a maximum dose of 10,000,000 fragments was reached. Each injection was followed by a marked increase in the diarrhœa from which the patient was then suffering. No other reaction, either local or general, was observed.

The result of treatment, both with potassium iodide and with vaccines, seems to coincide more or less with the results obtained by Colebrook[1] in cases of thoracic and abdominal actinomycosis.

Autopsy.

The body showed a considerable degree of emaciation. Some œdema was present about the ankles. The sites of the abdominal operation wounds were indicated by the presence of healthy scar tissue. The viscera on the right side of the abdomen were bound together by adhesions; separation of the cæcum brought to view a small, greyish, necrotic area presumably corresponding with the site of the appendix amputation. Behind the peritoneum was a track of yellowish grey, somewhat purulent granulation tissue which, commencing behind the cæcum, passed upwards in front of the right kidney and behind the liver. Penetrating the diaphragm the organism had infected the lower part of the right pleura, which was separated from the healthy pleura by dense adhesions; the track of granulation tissue was continued into the thoracic wall and communicated with the exterior through a number of narrow sinuses.

The infection had spread into the right kidney and the liver, producing in each of these organs a single large lesion consisting of multiple nodules, many of which had broken down in the centre and in some cases contained pus. Very few streptothrix granules were visible in these lesions. The mesenteric glands were somewhat enlarged and of a yellowish colour, but no granules were found in them. A number of small lesions, more numerous on the right side, were found scattered throughout both lungs; the majority of these were irregular in shape and firm in consistence, but a few contained pus. A small abscess containing actinomycotic granules was present in the spleen. No foci of infection were observable elsewhere in the body. The spleen was enlarged and showed advanced hyaline degeneration; a slighter degree of this form of degeneration was found in the kidneys, but none in the liver, which had undergone fatty degeneration. On microscopical examination sections of the lesions presented the usual appearance of granules embedded in a cellular zone with fibrous tissue at the periphery.

The Organism.

Granules for examination were obtained from the sinuses in the thoracic wall and from the sputum; post-mortem, sections of granules were seen in preparations made from the affected organs. Cultures were obtained from material discharged through the thoracic wall. The granules as seen in the pus and sputum consisted of masses of slender mycelial filaments, many of which were so short as to simulate bacilli. Branching was seen in a few instances. The filaments were Gram-positive and for the most part were evenly stained by this method, but a few threads were irregularly stained and presented a dotted appearance. No spores were seen in preparations from the pus. The presence of clubs was not demonstrated. The organism was not acid-fast. Granules from the pus were inoculated in broth and on the surface of glycerine agar and of Dorset's egg medium; stab cultures were prepared in glucose agar. In the primary cultures no growth of a streptothrix was obtained in the tubes incubated aerobically, all of which contained staphylococci; under anaerobic conditions the streptothrix grew in all the media inoculated, growth becoming visible about the fourth day. The organisms failed to thrive in subcultures. On the tenth day the surface colonies were greyish-white, heaped up, coherent; the majority were circular in outline. Fragmentation seems to have occurred in all the colonies; the appearance of the films was that of somewhat sinuous rod-segments with here and there a longer thread sometimes showing branching. In many individuals one end was swollen and contained a spore. Films prepared from the broth cultures presented similar appearances, and in an agar suspension culture examined as late as the seventeenth day no spores were found. Here the colonies were cream-coloured and irregular in shape.

The organism appears to show the main characteristics of the *Actinomyces bovis* as described by Wolff and Israel,[2] Homer Wright,[3] and Colebrook.[4] The filaments would seem to have been shorter than those usually described; this feature was particularly striking in preparations from the cultures. Israel and Wolff noticed a tendency for the organisms examined by them to assume a bacillary form on artificial media. Referring to the streptothrices in general Foulerton[5] draws attention to a tendency to the appearance of fragmentation and of spore formation on artificial media. It is not surprising, therefore, that these degenerate forms should be present in cultures examined as late as the tenth day.

We are indebted to Dr. F. G. Chandler and Dr. S. Roodhouse Gloyne for permission to publish the records of this case, and to Mr. A. W. Smart for preparing the sections for microscopical examination.

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Clinical and Laboratory Notes.

THE PANCREAS OF TELEOSTEAN FISHES AND THE SOURCE OF INSULIN.

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AND
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IT is well known that in teleostean fishes there is a more or less complete separation of the islets of Langerhans from the zymogenous tubules of the pancreas. This was pointed out years ago by Diamare, Rennie, and Vincent and Thompson.

Soon after the announcement by Banting, Best, Collip, and Macleod of the successful preparation of pancreatic extracts containing insulin, Macleod[1] turned his attention to the pancreas of teleosts in order to determine whether the active substance is in fact derived from the islets, or whether it may be obtained from zymogenous tissue and islet indiscriminately—that is to say, from the pancreas as a whole. He found that potent insulin preparations could be made from separated islet tissue of Lophius and Myoxocephalus. He failed to prepare any insulin from the pancreatic tissue proper (zymogenous or acinar) of Lophius, Myoxocephalus, or Zoarces. His conclusion was that insulin, as its name implies, is derived from the insular and not the zymogenous tissue of the pancreas.

At the outset it was suspected that the "islets" of the above-named species do not consist absolutely of islet tissue, but contain a certain amount of acinar material. It was also by no means certain that the somewhat elusive pancreas of teleosts was entirely free from islets. The degree of concentration of insular material into the "principal islets" varies within very wide limits. For this reason, and for the reason that considerable amounts of insulin were obtained[2] from, for example, submaxillary gland and other tissues, it was thought desirable to re-investigate the matter, using the method of Dodds and Dickens.[3] This method is particularly applicable to small quantities of material.

With this object we worked for a week in the laboratory of the Marine Biological Station at Plymouth. The two species investigated were *Lophius piscatorius* and *Myoxocephalus bubalis*. In the majority of specimens of both these species it is not difficult to obtain separately a fair amount of "principal islet" and of mesenteric zymogenous pancreas. Roughly speaking, the islet tissue has been found to yield six or seven times the amount of insulin obtainable from the same weight of zymogenous tissue. But it must be pointed out that our results differ from those obtained by Macleod in one important respect, for whereas he obtained no insulin whatever from zymogenous tissue we have found a very appreciable amount—enough, indeed, to produce definite symptoms of hypoglycæmia when tested upon rabbits in the usual way. This difference may probably be explained partly by the difference in the method of extraction, and partly by the precaution which we have taken to employ perfectly fresh material. With less fresh material, the amount of insulin obtained from zymogenous tissue was appreciably less. The main result of our investigation is, however, entirely confirmatory of that of Macleod.

It was found by Vincent and Thompson[4] in several lake and river teleosts that the "principal islet" was always permeated by strands of zymogenous tissue. Whether this is true in marine teleosts we cannot say until our histological material has been examined, but it is certain that minute specks of islet tissue, visible to the naked eye, are scattered throughout the pyloric portion of the pancreas.

It must be confessed that, making due allowances for the possibility mentioned in the last paragraph, the result stands out very clearly that the source of insulin is, in fact, islet tissue. We are justified in assuming, at any rate provisionally, that this is true also in mammalian pancreas.

It appears then that, notwithstanding the intimate anatomical relationship between islet and zymogenous tubules, the numerous transition forms in all groups of vertebrates, and the transformation of alveolus into islet and vice versa under different physiological conditions, notwithstanding all these considerations, the temporary modification of tubule into islet carries with it the assumption of a new function, that of the internal secretion of insulin.

A full account, with details of this investigation, will appear at an early date.

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INCIDENCE OF HEART LESIONS IN INFECTIVE ARTHRITIS.

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IN view of the recent interest in various forms of rheumatism, and of the fact that most authors state that heart lesions are rare complications of rheumatoid, or infective, arthritis, the following figures may be of value :—

Fifty cases (all females) were taken in rotation as they were admitted to the Devonshire Hospital, all of the type known as chronic infective, or rheumatoid, arthritis, between 17 and 72 years of age, giving histories of onset between 12 and 55.

I have divided them into six groups according to the condition of the heart: (A) Cases showing a murmur at one or more valve areas, with dilatation and subjective symptoms of palpitation or dyspnœa. (B) Cases with dilatation and subjective symptoms but no murmur. (C) Cases with murmurs and enlargement, but showing no subjective symptoms. (D) Cases showing murmurs but no enlargement or symptoms traceable to the heart. (E) Cases showing cardiac irregularity but no other evidence of damage to the heart. (F) Cases showing no cardiac abnormality.

The relation of other factors in the history is shown in the table.

Group	A	B	C	D	E	F
Number of cases	5	2	2	10	1	30
Family history of chronic rheumatism	2	2	—	5	1	13
Family history of rheumatic fever	1	—	—	—	—	3
Existence of pyorrhœa	4	1	2	7	1	21
Disease of tonsils	1	1	—	3	—	4
No focus discovered	1	—	—	2	—	—
Personal history of rheumatic fever in childhood	1	—	—	1	—	—
History of "growing pains" in childhood	2	1	—	5	—	7
Average age of onset of infective arthritis	27·4	36·5	35·0	28·4	35·5	35·5
Average duration since onset, in years	16	6·5	2	7·4	3	7·6

The table shows, therefore, that there were heart lesions in 20 out of 50 cases admitted, only 2 of whom give a history of acute rheumatism which might account for it. The remainder were all healthy until the onset of their chronic arthritis, as far as one can discover.

The enormous incidence of pyorrhœa in these cases is worthy of note, in relation to any preventive campaign, as is also the large number of cases giving a history of arthritis in the family, which probably provided the infecting organisms in the first place.

I am indebted to the members of the honorary medical staff for permission to publish these figures.

A CASE OF TORSION OF THE OMENTUM SIMULATING APPENDIX ABSCESS.

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THE following case appears to be sufficiently uncommon to merit report :—

A. C., a married woman aged 44, was admitted to Salford Royal Hospital on Nov. 27th, 1923.

History.—For three days before admission the patient had suffered from pain in the right iliac fossa, which had commenced suddenly and had persisted up till the time of admission. She had vomited frequently. An enema given on the day before admission to hospital had had a large constipated result, but previous to this the bowels had not acted for a week. There were no urinary symptoms, menstruation was normal, and she had had no previous abdominal trouble. Since the birth of her last child she had noticed a prolapse of the uterus, and a hernia on the right side.

Condition on Examination.—Temperature 100° F., pulse 84. There was definite tenderness and rigidity in the right iliac fossa, and a tender mass could be felt extending inwards nearly to the middle line and upwards to the umbilicus. I could find no definite evidence of hernia. I detected nothing abnormal on rectal examination.

Operation.—A provisional diagnosis of appendix abscess was made and I opened the abdomen by a paramedian incision, displacing the right rectus muscle outwards. Lying in the region in which the lump had been felt was a somewhat rolled-up mass of purple, congested, almost gangrenous omentum. It consisted of approximately the right half of the great omentum, and its lower extremity disappeared behind the posterior surface of a previously undiagnosed, flaccid, unilocular ovarian cyst springing from the left ovary and occupying the cavity of the pelvis. Above, the congestion of the omentum ceased abruptly at a point about one inch below its attachment to the transverse colon. The left side of the omentum was normal, and there was a well-defined line of demarcation between it and the congested portion. Separation of the congested from the normal omentum and from the underlying small intestine was easily carried out by the finger tip, when a thin prolongation of the congested omentum was found, firmly adherent to the posterior surface of the ovarian cyst. This adhesion, which appeared to be of long standing, was divided. Except at its upper attachment the omentum was now free, and it could be seen that the congestion was due to a rotation of the right portion through half a circle to the left, round a broad base situated at the upper limit of the congested area. The diseased omentum was ligatured and removed. The appendix was thickened, bound down by adhesions, and chronically inflamed, but showed no sign of recent acute inflammation. Appendicectomy was performed. The ovarian cyst was also removed. It showed no sign of secondary change and there was no rotation of its pedicle. The abdomen was then closed. Convalescence was uneventful.

In referring to torsion of the great omentum text-books state that the condition is very uncommon and, when found, is usually associated with an irreducible right inguinal or femoral hernia. Thomson and Miles[1] state that, "in the absence of hernia torsion of the omentum has usually been mistaken for appendicitis or for an ovarian cyst, the pedicle of which has become twisted." I have no doubt that in this case the adhesion of the omentum to the ovarian cyst, by forming a lower point of attachment for the omentum, allowed of its rotation on its long axis with resulting strangulation.

I am indebted to Mr. Geoffrey Jefferson, assistant surgeon to the Salford Royal Hospital, for permission to publish this case.

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[1] Thomson and Miles: Manual of Surgery, vol. ii. Oxford Medical Publications.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

CLINICAL MEETING OF THE SECTION OF SURGERY: SUBSECTION OF PROCTOLOGY IN CONJUNCTION WITH THE AMERICAN PROCTOLOGIC SOCIETY.

THE annual clinical meeting of this subsection, in conjunction with the American Proctologic Society, was held on Wednesday, Thursday, and Friday, July 9th–11th, with Mr. Aslett Baldwin, the President, in the chair. The discussion on Wednesday on the

Treatment of Hæmorrhoids by Injection

was opened by Mr. H. Græme Anderson, who traced the history of this method. First employed by quacks, it was later taken up by American proctologists, and first introduced to this country by Mr. Swinford Edwards about 25 years ago. Many different substances had been employed, including solutions of carbolic acid, quinine and urea, perchloride of iron, &c. He then proceeded to describe his own technique; he employed a special needle and syringe and injected a 10 per cent. solution of carbolic acid containing glycerine. This method of treatment was applicable only to uncomplicated internal hæmorrhoids. About 15 per cent. of cases recurred, but could be relieved by a repetition of the operation.

Dr. C. E. Dukes discussed the pathological changes provoked by carbolic acid. By cutting a number of sections of hæmorrhoids, injected with carbolic acid and renewed at periods varying from 1 to 21 days he was able to follow the changes as they occurred. These were illustrated by microscope slides and epidiascope preparations. He arrived at the following conclusions: Carbolic acid caused an aseptic inflammation characterised by dilatation of the vessels, emigration of the leucocytes, and transudation of lymph. By this means the alien liquid was diluted and removed; thereafter the inflammation quickly subsided. Thrombosis was frequently found in the vessels of piles removed after periods longer than five days after injection. This was partly due to injury to vessels by the needle, and partly to damage to the vascular endothelium by carbolic acid. It was the secondary changes particularly in the intravascular clotting and subsequent fibrosis which had the beneficial effect upon the piles.

Mr. Swinford Edwards and Mr. J. P. Lockhart-Mummery and Dr. Alfred J. Zobel (San Francisco) continued the discussion. The last-named used the injection method in the case of patients who could not spare the time necessary for operation, since by the former method the patient was able to carry on his business whilst undergoing the treatment. He believed that a few were cured, but nearly all were relieved, and if recurrence took place patients were usually willing to submit themselves to further treatment.

Dr. Jack Halton (Florida) was an enthusiastic advocate of the injection method after personal experience of it. He believed that nine-tenths of uncomplicated cases were cured. He employed quinine urea 5 per cent. solution and injected 2 to 6 minims into each pile. Only one pile was treated at a time, and each pile might require three injections.

Mr. W. S. Perrin gave the results of treatment in 380 cases of uncomplicated piles by injection with 10 per cent. carbolic acid solution. About 50 per cent. were absolutely cured, and a little over 30 per cent. were substantially cured, but complained of trivial symptoms. Four cases of recurrence had needed re-injection and five had eventually to be operated upon. He had come to the conclusion that the method was applicable to most cases of uncomplicated piles provided they were not of very large size.

Mr. Cecil Rowntree considered that this method gave admirable results in those cases of uncomplicated hæmorrhoids in which hæmorrhage was the chief or only symptom.

Dr. F. L. Jelks (Memphis) opposed the injection treatment very strongly and described some disastrous cases which had come to him after being treated by injection.

Mr. Lionel E. C. Norbury had seen complicated fistulæ result from the injection of hæmorrhoids which were partly internal and partly external, and thought that this variety of hæmorrhoid should not be so treated.

Mr. Græme Anderson replied, and pointed out that bad results usually occurred from using too strong a solution. After trial of various solutions, he had adopted a 10 per cent. solution of carbolic acid as the best.

The discussion on Thursday, July 10th, was opened by Dr. Louis J. Hirschman (Detroit), who described his operation for

Prolapse of the Rectum,

which depended upon shortening the mesentery of the sigmoid through an abdominal incision. This was illustrated on the epidiascope. He claimed that the results of this operation were very satisfactory.

Mr. Lockhart-Mummery admitted the difficulty of treating this complaint and described his own operation.

Dr. William M. Beach (Pittsburg) pointed out that Dr. Hirschman's operation resembled that of Moscovitch.

Mr. W. E. Miles outlined the pathology of prolapse of the rectum and described a first, second, and third degree. The first and second degrees were easily treated by a variety of well-known operations, but the third degree (in which the peritoneum was included in the prolapse) was exceedingly difficult to treat, and he doubted whether Dr. Hirschman's operation would be successful in this stage.

Sir Charles Gordon-Watson said that prolapse of the rectum in children was curable by dieting and careful regulation of habits without any operation.

Dr. Ralph W. Jackson (Fall River) agreed that operation was rarely necessary for better-class children, but was imperative for the neglected children of the very poor classes. He then employed a cautery.

Pruritus Ani.

Dr. J. G. Montague exhibited a cinematograph film illustrating the pathology of this condition and its treatment by the operation he had devised. He considered that the irritation was due to the cutaneous nerve filaments being caught in masses of fibrous tissue which were formed, he believed, as a result of infection. The operation he performed resembled Ball's operation, except that he made four small incisions with blunt scissors. The operation was combined with treatment by vaccines of *B. coli* and *Staphylococcus albus*, which were the usual infecting organisms.

Sir Charles Gordon-Watson called attention to the enlarged anal papillæ often present in pruritus ani. A certain proportion of cases were cured by cauterisation of these papillæ.

Dr. Dukes gave the result of a histological study of the distribution of sensory nerves in enlarged anal papillæ. Contrary to the generally accepted statements he had been able to show that a plexus of nerves surrounded the blood-vessels and these terminated in tactile corpuscles. Microscopic slides were exhibited.

On Friday, July 11th, a discussion took place on the

Treatment of Carcinoma of the Rectum.

Mr. W. Ernest Miles, who opened, said that of the three methods of spread of cancer of the rectum, by direct extension, by the blood-stream, and by the lymphatic system, the last was of the greatest importance. He then dealt at considerable length with the lymphatic system of the rectum in its various divisions, intramural, intermediate, and external, and illustrated his remarks with diagrams and drawings of microscopic preparations. The intramural plexuses of fine lymphatics, he pointed out, did not have a very long course along the length of the bowel, but were partially separated into systems each occupying a short zone of bowel, and draining by larger trunks to glands lying outside the bowel. The most important of these was the ano-rectal group of 10 to 15 glands lying just above the levator ani. In all the specimens of cancer of the rectum he had examined these glands were infected by cancer cells, even when no other deposits were to be found. From the ano-rectal glands cancer might spread in three directions—upwards along the retro-rectal glands, laterally to the glands in the pelvis as far out as the obturator vessels, and downwards to the fat and glands in the ischio-rectal fossæ. From the retro-rectal glands the cancer cells might find their way to the paracolic glands higher up, so that the latter were not necessarily infected in series; it followed that one could not argue from the fact that the paracolic glands attached to a short section of excised bowel were free from cancerous deposit, that other glands higher in the paracolic chain were also free. Photographs of two specimens excised at operation were then shown. The first exhibited a secondary spread of the cancer upwards, laterally and downwards—widespread dissemination in spite of the fact that it was an early case. In the second the primary growth had extended around three-quarters of the circumference of the bowel. Microscopic examination showed that the cancer cells had already passed through the muscular coat of the bowel and lymphatics. Spread was taking place, though judged by clinical standards the growth was an early one, since it was freely movable. Fixation of a growth in the rectum indicated the passage of the cancer process through the fascia propria of the rectum and indicated a widespread dissemination and a grave prognostic outlook, even after a very radical operation. Mr. Miles maintained that the mesentery of the rectum and sigmoid in cancer of the rectum were comparable with the axillary contents in the case of cancer of the breast, and that it (the mesentery) should be removed as widely as possible in all cases, early or late, whether the contained glands were obviously infected or not. Nothing less was performed in breast cancer and nothing less should be performed in cancer of the rectum. The perineal operation failed in this important respect; he therefore practised and advocated the abdomino-perineal operation.

The Perineal Operation.

Mr. LOCKHART-MUMMERY said he performed the operation advocated by the previous speaker 20 years ago, but had abandoned it since 1913, except for the high cancers at the recto-sigmoidal junction. For cancer in the latter locality he recognised that it was the logical treatment and still performed it, but for other cancers of the rectum he had abandoned the abdomino-perineal operation in favour of the perineal one, which was attended with a lower mortality and applicable to a larger proportion of cases. There were many advantages in having a standardised operation in which the various technical details did not vary. He performed the perineal operation in two stages. The first was a colostomy, and the second, 14 days later, was the excision in one piece of the rectum and as much of the sigmoid and its mesentery as could be brought down together with the anus and surrounding skin, the contents of the ischio-rectal fossæ, and parts of the levatores ani. This operation removed all the glands primarily infected and some of those in the second group. He used spinal anæsthesia in conjunction with gas and oxygen for men, with "twilight sleep" for women. The patient was able to get up 14 days later and to go home within a month. The mortality of this operation taking all cases, private and hospital, together was 9·3 per cent. The recurrence figures were surprisingly low. During the years 1915–19 65 cases were submitted to this operation, of whom 30 were alive and well five years later. He thought that these figures were at least as good as those obtaining with the abdomino-perineal operation.

Dr. W. H. KIGER (Los Angeles) considered that Mr. Miles's operation was the best and most thorough that had yet been devised. He had been working on different lines and had had a considerable degree of success from the slow "cooking" of rectal cancers by low temperature heat. This method was based on the lower degree of resistance to heat of the cancer cell compared with the normal, and was advocated only for inoperable or for very early cases, when the patient refused an operation involving colostomy. He used electric cauteries introduced through a water-jacketed speculum. [These instruments were exhibited.] Although many of his cases appeared to be quite hopeless, he had six or eight patients alive and well five years after the destruction of a rectal cancer by slow cooking.

Advantages of Local Operations.

Mr. SWINFORD EDWARDS, while recognising the merits of the abdomino-perineal operation from a theoretical or pathological point of view, held that very good results could be obtained from a much less drastic procedure. He could recall three cases he had dealt with many years ago by local excision through a linear proctotomy with complete restoration of the bowel and a normal anus. He was uncertain of the fate of the third, but he knew that two were alive and well to-day. The perineal operation which he had largely practised (a modification of Kraske's) aimed at retaining the normal anus whenever possible—a very important matter from the patient's point of view. This operation, while obviously very incomplete from a pathological aspect, had given a cure-rate at three years of 45 per cent. in proven cancers, with a mortality of only 5 per cent. After seeing Mr. Miles's diagrams, he was convinced that he must almost invariably have left many secondary cancerous deposits in lymphatics. From this he could only conclude that these secondaries must in many cases wither up and become inert. He felt very strongly that when so great a degree of success attended these very limited operations, it was unjustifiable to submit patients to a procedure with a mortality of 20–30 per cent, even in expert hands, however perfect that operation might be from a pathological standpoint.

Dr. FRANK C. YEOMANS (New York) referred to the cancer campaign held in America with the object of getting earlier diagnosis of rectal and other cancers. A few ulcers of the rectum were of doubtful malignancy; in such cases he preferred the small risk of cutting out a portion for microscopy to the needless risk of submitting a patient with a benign ulcer to a cancer operation. A great improvement in the results of the more drastic cancer operations had recently set in owing to improvements in anæsthesia and operative technique. In New York the abdomino-perineal operation was standardised for cancers at the recto-sigmoidal junction, Balfour's operation for higher growths, and the perineal operation for lower ones. His own rule was to perform a perineal operation when the growth could be reached by the finger, and he had several cases alive and well seven or eight years after this operation.

Sir C. GORDON-WATSON agreed with Mr. Lockhart-Mummery. The abdomino-perineal operation, while undoubtedly superior on theoretical grounds, should be reserved for high growths, while for lower ones the perineal operation was the only one justifiable on clinical and practical grounds.

Dr. D. C. MCKENNEY (Buffalo) held a brief for the "glorified Whitehead" operation for those patients who refused any operation involving colostomy.

Mr. G. Grey Turner considered that Mr. Miles had evolved the theoretically perfect operation, but in his (Mr. Turner's) hands that operation was attended with a very high mortality. He then brought before the meeting the records of a number of cases treated by a sacral operation with a considerable degree of success. He had one case alive now 16 years after a sacral operation. Of 43 cases who had survived this operation, 12 could be claimed as cured and two had died of intercurrent disease. Even when not cured the patients often had great relief. As regards the question of retaining the normal anus, he felt that this could only be safely done in cases diagnosed very early. The occupations followed by some of his own cases showed that a properly made and regulated colostomy was not necessarily a serious inconvenience.

Dr. Curtice Rosser (Dallas) discussed the question of radiation of rectal cancers either by X rays or radium. In America Howard Kelly, of Baltimore, and Quirke, of New York, both claimed cures by radiation alone, and a higher cure-rate from the use of radiation combined with surgery than from surgery alone. While going through the records of his own cases he had come to the conclusion that growths originally benign frequently underwent malignant change.

A Statistical Survey.

Mr. W. B. Gabriel gave some statistical records from 130 cases operated on at St. Mark's Hospital by various surgeons. The operative mortality for all cases was 16 per cent. Sepsis accounted for the majority of deaths; four deaths occurred from urinary fistulæ, two from pneumonia, and one each from a variety of other causes, including post-operative obstruction due to a loop of small intestine being strangled in an opening in the peritoneum. 109 cases left the hospital, of whom 44 had since died; 80 per cent. of these deaths occurred within three years. Of the known sites of recurrence the pelvis and liver were the commonest. The oldest patient who still survived the perineal operation was now 82, and had been operated upon 13 years ago. The operability-rate had risen during the last five years from 44 per cent. to 54 per cent., due, perhaps, to more careful selection of the cases admitted to the wards. The percentage of cases alive and well, and showing no sign of recurrence, was 18 at three years after operation and 11·5 at five years.

Replies.

Mr. Miles, in reply, congratulated Mr. Lockhart-Mummery on the results he had obtained from the perineal operation. His own experience had been less fortunate. He had performed 59 perineal operations with one death and 56 recurrences. It was this experience which had led him to perform the abdomino-perineal operation, and to treat cancer in this situation as cancer elsewhere was treated by the removal of all the removable tissue which was likely to be infected. His mortality in 116 operations was 25 per cent., but of 53 cases operated upon since the war with improved anæsthesia (spinal anæsthesia combined with gas and oxygen) the mortality was 9·8 per cent. It was noticeable that ether had been administered in two cases since the war, and both these died. The operation he advocated demanded careful preparation, suitable anæsthesia, a well thought-out technique, and good after-treatment. In his hands it had yielded nearly 50 per cent. of cures.

Mr. Lockhart-Mummery thought that much depended upon the type of growth, and that what was chiefly lacking was some means of determining beforehand the degree of malignancy. He believed that some cases could not be cured by the most radical procedure, while others of apparently the same type might do admirably after a local excision.

The President remarked that he had performed the abdomino-perineal operation successfully upon a lady of over 76 years of age. She came back to see him when she was 85 years, accompanied by her husband, whom she had married since the operation.

JOINT MEETING OF THE SECTION OF ELECTRO-THERAPEUTICS OF THE ROYAL SOCIETY OF MEDICINE AND THE RONTGEN SOCIETY.

A joint meeting of the Section of Electro-Therapeutics of the Royal Society of Medicine and the Rontgen Society was held on July 5th at the Radcliffe Infirmary, Oxford, when Sir Thomas Horder delivered the Mackenzie Davidson Memorial Lecture on the

Influence of Radiology on the Criteria of Disease.

He said that medicine was indebted to radiology even more than to pathology in the investigation of disease of the deep parts. The X rays furnished evidence on alteration in function as well as in structure. They indicated focal sepsis in regions where it could not be detected clinically, as, for example, in the tooth sockets and nasal sinuses. The lecturer spoke on the revelations of dental radiography and the discovery of pus in cases in which the dental surgeon could find no evidence of pyorrhœa. Even if no pus were present the X rays could reveal evidence of infection by the discovery of a thickened periodontal membrane. Sir Thomas Horder pointed out that the belief that if no pus were present there was no infection would lead to serious error. X rays had proved that nephroptosis was not the grave malady it was formerly supposed to be, and had shown that displacement of the kidney could exist without the symptoms which were originally thought to be due to faulty position. When symptoms were present treatment of the patient rather than of the kidney was required. It was by the X rays alone that it could be decided whether faulty position of the hollow viscera was maintained by lack of tone or by the presence of adhesions. The author emphasised the necessity of realising the variation in position of the hollow viscera which could occur in healthy individuals. This variation made it very difficult in some cases to decide what was normal and what was abnormal. Patients should always be examined in different postures and palpation should be made during radioscopic examination. With regard to the varying position, Sir Thomas Horder thought that efforts to ascertain standards might stultify conclusions drawn from radioscopic examination. X rays also showed the influence of psychic disturbance on the movements and position of the hollow viscera. Attention was called to a case under radioscopic examination in which the stomach dropped and its peristaltic movements ceased at the moment when the patient received a sudden unexpected blow. The discrepancies between clinical and radiographic findings in certain cases—e.g., the discovery of gastric succussion on the couch one day and the failure to discover gastric dilatation next day by X rays, showed the influence of the emotions on the alimentary canal. X rays showed that abdominal belts raised the viscera in cases of enteroptosis and that exercise caused a similar effect. X rays were, further, of great value in showing the presence of enlarged lymphatic glands in regions—e.g., the hila of the lungs—where they could not be detected clinically, and in showing the alterations in size which they could undergo. The rays also showed, in some cases of carcinoma of the breast, that the distribution of the growth was more extensive than that shown by clinical examination. They showed also that metastases in bone occurred much more frequently than was formerly thought. Patients were thought to be suffering from rheumatism whereas the rays showed the presence of secondary growths in bone, and good skiagrams showed rarefaction. With regard to the therapeutic uses of X rays in malignant growth, the lecturer said that X rays had altered our notions regarding the progressive character of malignant disease. Cancer was to some extent controllable by radiation, and many patients lived direct extension, by the blood-stream, and by the lymphatic system, the last was of the greatest importance. He then dealt at considerable length with the lymphatic system of the rectum in its various divisions, intramural, intermediate, and external, and illustrated his remarks with diagrams and drawings of microscopic preparations. The intramural plexuses of fine lymphatics, he pointed out, did not have a very long course along the length of the bowel, but were partially separated into systems each occupying a short zone of bowel, and draining by larger trunks to glands lying outside the bowel. The most important of these was the ano-rectal group of 10 to 15 glands lying just above the levator ani. In all the specimens of cancer of the rectum he had examined these glands were infected by cancer cells, even when no other deposits were to be found. From the ano-rectal glands cancer might spread in three directions—upwards along the retro-rectal glands, laterally to the glands in the pelvis as far out as the obturator vessels, and downwards to the fat and glands in the ischio-rectal fossæ. From the retro-rectal glands the cancer cells might find their way to the paracolic glands higher up, so that the latter were not necessarily infected in series; it followed that one could not argue from the fact that the paracolic glands attached to a short section of excised bowel were free from cancerous deposit, that other glands higher in the paracolic chain were also free. Photographs of two specimens excised at operation were then shown. The first exhibited a secondary spread of the cancer upwards, laterally and downwards—widespread dissemination in spite of the fact that it was an early case. In the second the primary growth had extended around three-quarters of the circumference of the bowel. Microscopic examination showed that the cancer cells had already passed through the muscular coat of the bowel and lymphatics. Spread was taking place, though judged by clinical standards the growth was an early one, since it was freely movable. Fixation of a growth in the rectum indicated the passage of the cancer process through the fascia propria of the rectum and indicated a widespread dissemination and a grave prognostic outlook, even after a very radical operation. Mr. Miles maintained that the mesentery of the rectum and sigmoid in cancer of the rectum were comparable with the axillary contents in the case of cancer of the breast, and that it (the mesentery) should be removed as widely as possible in all cases, early or late, whether the contained glands were obviously infected or not. Nothing less was performed in breast cancer and nothing less should be performed in cancer of the rectum. The perineal operation failed in this important respect; he therefore practised and advocated the abdomino-perineal operation.

The Perineal Operation.

Mr. Lockhart-Mummery said he performed the operation advocated by the previous speaker 20 years ago, but had abandoned it since 1913, except for the high cancers at the recto-sigmoidal junction. For cancer in the latter locality he recognised that it was the logical treatment and still performed it, but for other cancers of the rectum he had abandoned the abdomino-perineal operation in favour of the perineal one, which was attended with a lower mortality and applicable to a larger proportion of cases. There were many advantages in having a standardised operation in which the various technical details did not vary. He performed the perineal operation in two stages. The first was a colostomy, and the second, 14 days later, was the excision in one piece of the rectum and as much of the sigmoid and its mesentery as could be brought down together with the anus and surrounding skin, the contents of the ischio-rectal fossæ, and parts of the levatores ani. This operation removed all the glands primarily infected and some of those in the second group. He used spinal anæsthesia in conjunction with gas and oxygen for men, with "twilight sleep" for women. The patient was able to get up 14 days later and to go home within a month. The mortality of this operation taking all cases, private and hospital, together was 9·3 per cent. The recurrence figures were surprisingly low. During the years 1915–19 65 cases were submitted to this operation, of whom 30 were alive and well five years later. He thought that these figures were at least as good as those obtaining with the abdomino-perineal operation.

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of the book largely depends upon the historical setting in which it is framed. We feel that we are the legitimate successors of Hippocrates and Celsus, of Paré and Lavater, and we gain a new conception of the continuity of our art and a new appreciation of the skill and insight of its founders. Every known variety of hernia receives full discussion, backed by ample statistical information and an elaborate bibliography.

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Taken as a whole the work is a very good and satisfactory text-book. The most careful critic can only point to minor blemishes. The book is illustrated by a number of informative coloured and monotone plates which are beautifully reproduced.

HEARING.

By R. M. OGDEN, Professor of Education in Cornell University. London: Jonathan Cape. 1924. Pp. 351. 15s.

IN this book Prof. Ogden deals with the psychological aspect of hearing—that is, with the manner in which sound affects the conscious mind—and he travels through subjects many of which are of interest to medical men in general and to otologists in particular. In the first two chapters are described briefly, but adequately, the physics of the sound-wave and the anatomy of the hearing organ. This is followed by a disquisition on the physiological theories of hearing from that of Helmholtz to that of Wrightson; the author does not attempt to decide between the opposing "resonance" and "telephone" theories of audition.

Every variety of sound can be classified into the three groups of tones, vocables, and noises. A most interesting description of the attributes of tone is given, that of brightness is ascribed to variation of the wave-form whereby the pulsation is shortened in comparison to the wave-length so that the trough becomes longer than the crest. There is a long discussion of vocables, or the characteristics of vowel sounds, and of Hermann's theory of "formants"; but surely the sound of "ê," as in "fête," is not a pure vowel, but a diphthong. A large part of the book is concerned with the character of sounds in relation to music, and interesting references are included to the musical scales of primitive races, of ancient Greeks, and of Oriental peoples. A chapter of more direct medical interest deals with the localisation of sound. The physical conditions under which a binaural sound is localised are primarily three: (1) the intensity ratio of the sound at the two ears, (2) the phase-difference of the sound-wave, and (3) the relative time of arrival of the sound at the two ears. Interesting experiments are given as to the bearing of these three factors on localisation. A chapter on the pathology of hearing is rather disappointing; it is not sufficiently full to be of real value, and is perhaps a little out of place in a book of this kind. Of the experiment with a tuning fork on the vertex it is said: "If one of the external canals is closed, the intensity of the sound in the closed ear is increased by reason of the fact that the passage of the sound-waves outward is to some extent interfered with, so that the imprisoned column of air resonates"; but is this a satisfactory explanation? For it is certain that the same phenomenon occurs when the meatus is solidly filled with cerumen or any other material. The paragraphs on the nature of auditory defects, deaf-mutism, and mechanical aids to hearing are quite inadequate. The book ends with a criticism of musical education in America, and a plea for better aural education in speech, which would also be applicable to this country.

MINOR SURGERY AND BANDAGING.

Eighteenth edition. By GWYNNE WILLIAMS, F.R.C.S. London: J. and A. Churchill. 1924. Pp. 423. 10*s.* 6*d.*

A VOLUME which started upon its career in 1861 and which has passed through 18 editions may be regarded as something more than a classic, it is almost a household friend. It would be interesting to compare the last edition with the first and to see how much remains of the original pages, but it is certain, anyhow, that Christopher Heath would be the first to appreciate the sound common sense and the practical outlook of his grown-up child. In the preface the author expresses a modest hope that it may continue to be a guide to house-surgeons and students. There is scarcely a page from which the practising surgeon may not pick up a useful hint, from the tying of a knot to the putting up of a fractured femur. Incidentally, the chapters on fractures are particularly good and will repay careful study even by a surgeon of experience. We should like to recommend the book to those who teach surgery. Minor surgery is what the student should know thoroughly if he is to be efficient in any branch of his profession. He may leave hospital full of the latest details of gastrectomy and bone-grafting, but entirely unable to treat a dropped finger. A book like this would do much to restore in his teacher as well as in himself a true sense of proportion.

PHYSIOLOGY.

Human Physiology: A Practical Course. By C. G. DOUGLAS, C.M.G., M.C., D.M., F.R.S., Fellow of St. John's College, Oxford; and J. G. PRIESTLEY, M.C., D.M., Christopher Welch Lecturer in Clinical Physiology, University of Oxford. Oxford: Clarendon Press. 1924. Pp. 232. 12*s.* 6*d.*

FOR general utility as well as breadth, the course given for the Final Honour School of Physiology in Oxford must be admitted to come second to none. Local conditions are favourable, and such courses are not given elsewhere, for various reasons. Teachers who wish to imitate the Oxford course, which they may well desire to do, have now fairly full accounts of the wide range of exercises comprised in the studies at Oxford. The present book deserves nothing but praise—the description of experiments is admirably longer and more comfortably after their application. Sir Thomas Horder prophesied that these X rays would play a conspicuous part in the elucidation of the problems of malignant disease.

Prof. Sidney Russ read a paper entitled

Experimental Studies on the Lethal Doses of X Rays and Radium on Animal Tissues.

He defined a lethal dose as the dose which prevented proliferation of the malignant cells, not that which destroyed them. He described experiments which he had conducted on animals which were exposed to radiation after grafting malignant tissues in them. After exposure the growth was transplanted into another animal and its proliferative powers noted. After exposure for 40 minutes it was found that 60 per cent. of the growth proliferated. After exposure for 55 to 60 minutes 1 per cent. only proliferated. The latter now required a much longer time of exposure to prevent its proliferation. The part which proliferated required a still longer exposure. Even after the latter a portion proliferated and required an even longer exposure. A stage was eventually reached in which proliferation could not be prevented by an exposure which was not sufficient to kill the animal if given in toto.

Prof. Russ had conducted experiments which showed the relation between the doses of soft and hard rays which caused either epilation, blistering, or lethal effects.

	Epilation.	Blistering.	Lethal.
Soft rays	21	38	56
Hard rays.. ..	126	228	146

He showed that the product of the time of exposure to radium and the intensity of the irradiation gave no accurate idea of dosage. Even with very long exposures it is doubtful whether the deep-lying cells often receive a lethal dose. It had been shown that the dividing cells require a shorter exposure than the growing cell for lethal action, but there was no known method of making cells divide at an appreciably greater rate by artificial means.

This change of vulnerability to radiation, according to the phase of the life-cycle, was perhaps of some importance in radiotherapy, though there was no way by which the cells might artificially be brought into the dividing stage. Prof. Russ submitted that under ordinary conditions the lethal dose that is of importance is the lethal dose for the growing and not for the dividing cells.

Further experiments were described showing the effects which X rays and radium have upon the resistance of the host. Whereas large doses might lead to the death of an animal, it had been shown that repeated small doses spread over considerable periods increased the body-weight and prevented such vigorous growth of tumour transplantations as occurs in the normal rat. Prof. Russ suggested that it might be well to supplement the thorough localised irradiation of a tumour by small generalised doses of radiation designed to increase the resistance to human growth.

Manchester and Maternity Nursing.—A new maternity home for 18 beds is about to be opened in Victoria Park by the Manchester and Salford District Nursing Institution, the intention being to make this a hospital for those who are prepared to pay from three and a half to five guineas a week for accommodation and skilled nursing. In addition, the home will also be a midwifery training centre for pupil midwives, and will assist institution nurses who wish to qualify for the C.M.B. certificate. Dr. Frances Ivens, of Liverpool, said that maternal mortality had not lessened in the last 20 years. To bear a child should be a normal physiological process, but it was often fatal and was often followed by terrible morbidity. The infant mortality-rate had been halved, and they must do the same with the maternal mortality-rate. The annual report showed that 57 nurses had been employed during the year and paid 164,101 visits. Over 8000 new patients had been attended, and the patients themselves had contributed £2046 to the funds.

Reviews and Notices of Books.

Practice of Medicine.

An Introduction to the Practice of Medicine. By William Boxwell, M.D. Dub., F.R.C.P.I., Professor of Pathology, Royal College of Surgeons, Ireland; Physician to the Meath Hospital, Dublin; and F. C. Purser, M.D. Dub., F.R.C.P.I., Professor of Medicine, Royal College of Surgeons, Ireland; Physician to the Richmond, Whitworth, and Hardwicke Hospitals, Dublin. London: Baillière, Tindall and Cox. Dublin: The Talbot Press, Ltd. 1924. Pp. 905.

Considerable courage is required to produce a new text-book for the use of medical students during their first years of clinical study. Established text-books have proved their worth, but, whilst their steady increase in size is a tribute to the progress of medicine, it has certainly rendered them dangerously bulky for the beginner.

The writers have approached their task from a new aspect. A brief account of general pathological and physiological features is introduced before the description of each disease or group of diseases, and it seems certain that this method is one calculated to be useful to the student, whose entry to the wards lies through the laboratories. We feel that high praise is due to the authors for the boldness of their endeavour and, if in some details we disagree, the general scope of their work must remain unchallenged. The section devoted to diseases of the nervous system appears disproportionately long; thus the account of asphasia on p. 756 contains such detailed description of the history of Broca's discoveries that the subsequent exposition of Marie's views is overshadowed, while if phenomena such as apraxia require exposition a fuller description of them seems desirable. On the other hand, the description of the significance of Babinski's signs is better than is usually given and the importance of these signs is well emphasised. The account of encephalitis lethargica on p. 628 will appear inadequate to readers in this country. In the section dealing with diseases of the ductless glands, the authors include diabetes mellitus, a classification justified by recent advances; the biochemical pathology here described is clearly written, but the statement on p. 807 that an estimation of blood-sugar should be made before and after the administration of every dose of insulin is one calculated to alarm both practitioner and patient and to bring disrepute upon an invaluable remedy. Future editions should receive drastic revision of the sections devoted to chemical laboratory tests. The present account of the tests for pancreatic insufficiency lays no stress on the importance of examining the fæces; Fehling's solution rather than Benedict's is recommended, and Rothera's test for acetone is not given; nor is mention made of the value of estimating the urea and non-protein nitrogen in the blood.

The general conception of this book is excellent; it keeps the pathological aspects of medicine clearly before the minds of its readers.

Hernia.

Its Anatomy, Etiology, Symptoms, Diagnosis, Differential Diagnosis, Prognosis, and Operative Treatment. By Leigh F. Watson, M.D., Associate in Surgery, Rush Medical College, Chicago, U.S.A. London: Henry Kimpton. 1924. Pp. 660. *52s. 6d.*

The author has accomplished his aim at producing a complete treatise on hernia. He has written a large but eminently readable volume, packed with information. Whether he is tracing the history of hernia from ancient Egypt through Greece and Rome, or discussing the latest applications of local anæsthesia, he equally succeeds in infecting the reader with his own enthusiasm for his subject. The attraction of the book largely depends upon the historical setting in which it is framed. We feel that we are the legitimate successors of Hippocrates and Celsus, of Paré and Lavater, and we gain a new conception of the continuity of our art and a new appreciation of the skill and insight of its founders. Every known variety of hernia receives full discussion, backed by ample statistical information and an elaborate bibliography.

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By R. M. OGDEN, Professor of Education in Cornell University. London: Jonathan Cape. 1924. Pp. 351. 15s.

IN this book Prof. Ogden deals with the psychological aspect of hearing—that is, with the manner in which sound affects the conscious mind—and he travels through subjects many of which are of interest to medical men in general and to otologists in particular. In the first two chapters are described briefly, but adequately, the physics of the sound-wave and the anatomy of the hearing organ. This is followed by a disquisition on the physiological theories of hearing from that of Helmholtz to that of Wrightson; the author does not attempt to decide between the opposing "resonance" and "telephone" theories of audition.

Every variety of sound can be classified into the three groups of tones, vocables, and noises. A most interesting description of the attributes of tone is given, that of brightness is ascribed to variation of the wave-form whereby the pulsation is shortened in comparison to the wave-length so that the [illegible] becomes longer than the crest. There is a long discussion of vocables, or the characteristics of vowel sounds, and of Hermann's theory of "formants"; but surely the sound of "ê," as in "fête," is not a pure vowel, but a diphthong. A large part of the book is concerned with the character of sounds in relation to music, and interesting references are included to the musical scales of primitive races, of ancient Greeks, and of Oriental peoples. A chapter of more direct medical interest deals with the localisation of sound. The physical conditions under which a binaural sound is localised are primarily three: (1) the intensity ratio of the sound at the two ears, (2) the phase-difference of the sound-wave, and (3) the relative time of arrival of the sound at the two ears. Interesting experiments are given as to the bearing of these three factors on localisation. A chapter on the pathology of hearing is rather disappointing; it is not sufficiently full to be of real value, and is perhaps a little out of place in a book of this kind. Of the experiment with a tuning fork on the vertex it is said: "If one of the external canals is closed, the intensity of the sound in the closed ear is increased by reason of the fact that the passage of the sound-waves outward is to some extent interfered with, so that the imprisoned column of air resonates"; but is this a satisfactory explanation? For it is certain that the same phenomenon occurs when the meatus is solidly filled with cerumen or any other material. The paragraphs on the nature of auditory defects, deaf-mutism, and mechanical aids to hearing are quite inadequate. The book ends with a criticism of musical education in America, and a plea for better aural education in speech, which would also be applicable to this country.

MINOR SURGERY AND BANDAGING.

Eighteenth edition. By GWYNNE WILLIAMS, F.R.C.S. London: J. and A. Churchill. 1924. Pp. 423. 10s. 6d.

A VOLUME which started upon its career in 1861 and which has passed through 18 editions may be regarded as something more than a classic; it is almost a household friend. It would be interesting to compare the last edition with the first and to see how much remains of the original pages, but it is certain, anyhow, that Christopher Heath would be the first to appreciate the sound common sense and the practical outlook of his grown-up child. In the preface the author expresses a modest hope that it may continue to be a guide to house-surgeons and students. There is scarcely a page from which the practising surgeon may not pick up a useful hint, from the tying of a knot to the putting up of a fractured femur. Incidentally, the chapters on fractures are particularly good and will repay careful study even by a surgeon of experience. We should like to recommend the book to those who teach surgery. Minor surgery is what the student should know thoroughly if he is to be efficient in any branch of his profession. He may leave hospital full of the latest details of gastrectomy and bone-grafting, but entirely unable to treat a crushed finger. A book like this would do much to restore in the teacher as well as in himself a sense of proportion.

PHYSIOLOGY.

Human Physiology: A Practical Course. By C. G. DOUGLAS, C.M.G., M.C., D.M., [illegible] Fellow of St. John's College, Oxford, and J. G. PRIESTLEY, M.C., B.M., B.Ch., [illegible] in Clinical Physiology, University of [illegible] Oxford: Clarendon Press. 1924. [illegible]

FOR general utility as well as [illegible] given for the final Honour School [illegible] Oxford and the admitted [illegible] local conditions [illegible] who wish to imitate [illegible] may well [illegible] at Oxford. The [illegible] practice. The [illegible] longer and more comfortably after their application. Sir Thomas Horder prophesied that these X rays would play a conspicuous part in the elucidation of the problems of malignant disease.

Prof. SIDNEY RUSS read a paper entitled

Experimental Studies on the Lethal Doses of X Rays and Radium on Animal Tissues.

He defined a lethal dose as the dose which prevented proliferation of the malignant cells, not that which destroyed them. He described experiments which he had conducted on animals which were exposed to radiation after grafting malignant tissues in them. After exposure the growth was transplanted into another animal and its proliferative powers noted. After exposure for 40 minutes it was found that 60 per cent. of the growth proliferated. After exposure for 55 to 60 minutes 1 per cent. only proliferated. The latter now required a much longer time of exposure to prevent its proliferation. The part which proliferated required a still longer exposure. Even after the latter a portion proliferated and required an even longer exposure. A stage was eventually reached in which proliferation could not be prevented by an exposure which was not sufficient to kill the animal if given in toto.

Prof. Russ had conducted experiments which showed the relation between the doses of soft and hard rays which caused either epilation, blistering, or lethal effects.

	Epilation.	Blistering.	Lethal.
Soft rays	21	38	56
Hard rays.. ..	126	228	146

He showed that the product of the time of exposure to radium and the intensity of the irradiation gave no accurate idea of dosage. Even with very long exposures it is doubtful whether the deep-lying cells often receive a lethal dose. It had been shown that the dividing cells require a shorter exposure than the growing cell for lethal action, but there was no known method of making cells divide at an appreciably greater rate by artificial means.

This change of vulnerability to radiation, according to the phase of the life-cycle, was perhaps of some importance in radiotherapy, though there was no way by which the cells might artificially be brought into the dividing stage. Prof. Russ submitted that under ordinary conditions the lethal dose that is of importance is the lethal dose for the growing and not for the dividing cells.

Further experiments were described showing the effects which X rays and radium have upon the resistance of the host. Whereas large doses might lead to the death of an animal, it had been shown that repeated small doses spread over considerable periods increased the body-weight and prevented such vigorous growth of tumour transplantations as occurs in the normal rat. Prof. Russ suggested that it might be well to supplement the thorough localised irradiation of a tumour by small generalised doses of radiation designed to increase the resistance to human growth.

MANCHESTER AND MATERNITY NURSING.—A new maternity home for 18 beds is about to be opened in Victoria Park by the Manchester and Salford District Nursing Institution, the intention being to make this a hospital for those who are prepared to pay from three and a half to five guineas a week for accommodation and skilled nursing. In addition, the home will also be a midwifery training centre for pupil midwives, and will assist institution nurses who wish to qualify for the C.M.B. certificate. Dr. Frances Ivens, of Liverpool, said that maternal mortality had not lessened in the last 20 years. To bear a child should be a normal physiological process, but it was often fatal and was often followed by terrible morbidity. The infant mortality-rate had been halved, and they must do the same with the maternal mortality-rate. The annual report showed that 57 nurses had been employed during the year and paid 164,101 visits. Over 8000 new patients had been attended, and the patients themselves had contributed £2046 to the funds.

Reviews and Notices of Books.

PRACTICE OF MEDICINE.

An Introduction to the Practice of Medicine. By WILLIAM BOXWELL, M.D. Dub., F.R.C.P.I., Professor of Pathology, Royal College of Surgeons, Ireland; Physician to the Meath Hospital, Dublin; and F. C. PURSER, M.D. Dub., F.R.C.P.I., Professor of Medicine, Royal College of Surgeons, Ireland; Physician to the Richmond, Whitworth, and Hardwicke Hospitals, Dublin. London: Baillière, Tindall and Cox. Dublin: The Talbot Press, Ltd. 1924. Pp. 905.

CONSIDERABLE courage is required to produce a new text-book for the use of medical students during their first years of clinical study. Established text-books have proved their worth, but, whilst their steady increase in size is a tribute to the progress of medicine, it has certainly rendered them dangerously bulky for the beginner.

The writers have approached their task from a new aspect. A brief account of general pathological and physiological features is introduced before the description of each disease or group of diseases, and it seems certain that this method is one calculated to be useful to the student, whose entry to the wards lies through the laboratories. We feel that high praise is due to the authors for the boldness of their endeavour and, if in some details we disagree, the general scope of their work must remain unchallenged. The section devoted to diseases of the nervous system appears disproportionately long; thus the account of asphasia on p. 756 contains such detailed description of the history of Broca's discoveries that the subsequent exposition of Marie's views is overshadowed, while if phenomena such as apraxia require exposition a fuller description of them seems desirable. On the other hand, the description of the significance of Babinski's signs is better than is usually given and the importance of these signs is well emphasised. The account of encephalitis lethargica on p. 628 will appear inadequate to readers in this country. In the section dealing with diseases of the ductless glands, the authors include diabetes mellitus, a classification justified by recent advances; the biochemical pathology here described is clearly written, but the statement on p. 807 that an estimation of blood-sugar should be made before and after the administration of every dose of insulin is one calculated to alarm both practitioner and patient and to bring disrepute upon an invaluable remedy. Future editions should receive drastic revision of the sections devoted to chemical laboratory tests. The present account of the tests for pancreatic insufficiency lays no stress on the importance of examining the fæces; Fehling's solution rather than Benedict's is recommended, and Rothera's test for acetone is not given; nor is mention made of the value of estimating the urea and non-protein nitrogen in the blood.

The general conception of this book is excellent; it keeps the pathological aspects of medicine clearly before the minds of its readers.

HERNIA.

Its Anatomy, Etiology, Symptoms, Diagnosis, Differential Diagnosis, Prognosis, and Operative Treatment. By LEIGH F. WATSON, M.D., Associate in Surgery, Rush Medical College, Chicago, U.S.A. London: Henry Kimpton. 1924. Pp. 660. *52s. 6d.*

THE author has accomplished his aim at producing a complete treatise on hernia. He has written a large but eminently readable volume, packed with information. Whether he is tracing the history of hernia from ancient Egypt through Greece and Rome, or discussing the latest applications of local anæsthesia, he equally succeeds in infecting the reader with his own enthusiasm for his subject. The attraction

THE LANCET.

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DILETTANTISM IN RADIOLOGY.

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Probably no discovery in physics has ever created so widespread a commotion or evolved more immediate interest than that of Prof. ROENTGEN in 1895, the obvious reason being that the superficial results were so striking and so easily appreciated. From the earliest days following the discovery, with very inadequate apparatus, with little or no knowledge of the physics of the subject, and with no literature to guide them, scientific men, both lay and medical, began to experiment with the new rays. Many of these men fell victims to their own enthusiasm, and to a heroic spirit which kept them still pursuing when the dangers had become apparent while no safeguards had arrived. This early band of workers included the dilettanti of their time, and let us recollect that we owe to these pioneers the foundation of the science and practice of radiology. Of the earlier workers many, fortunately, are still with us, while the scientific aspects of radiology have been put on a sound basis and a mass of tested knowledge has come into existence. The first dilettanti have developed, many of them, into our leaders, and for them the foreign word possesses no disparaging meaning. But they are not the semi-amateurs to whom the speakers at the Danish Conference were referring, who divide themselves roughly into several classes between which discrimination has to be exercised. There is the man who, in the first instance, has taken up X ray work as a hobby, and who passes into specialism without adequate training and, to a great extent, without knowing what he lacks. He is not to be confused with the man who believes that he can purchase an apparatus of such simplicity that it is fool-proof, but he none the less, and however unconsciously, represents badly the section of science which he essays to work at. There is also a most difficult class of radiologists to estimate in terms of professional utility. It is composed of physicians or surgeons who may be really wise and progressive, and who think that the interest of their patients may be served by their becoming their own radiologists. We need say nothing further of him who trusts to an instrument he does not understand. So quick will be the disillusionment that his class must always be a small one—the only fear is that its size should be magnified in popular opinion. Those who began by indulging a hobby will include both medical and non-medical persons, their existence may well be a danger, unless they are acting in a subordinate capacity and under very definite supervision. The consultant by doing all his own spade-work may lose something of his fineness of judgment and imitate the judge who plays the advocate. We know that there are exceptions to this generalisation, but any hasty or not absolutely necessary action by this group may give a very serious set-back to the growth of "team-work" in this country. This would be a calamity.

In the case of X ray therapy there is, we feel, nothing that can be said in favour of practice being in the hands of other than skilled and experienced men. If the present tendency towards the employment of more intensive therapy continues, the problems to be solved will be of magnitude. Even now it is impossible to exaggerate the necessity for careful selection of cases suitable for radiotherapy, and for the most precise indications as to dosage and definite skilled supervision during treatment. All these things imply not only special knowledge but experience, and they constitute the considerations which led to the institution of a special diploma in radiology. The interests of the patient above all, the difficulty of X ray diagnosis, and the great handicaps experienced by the early workers, were all factors in the minds of those who urged the advisability of special training. The University of Cambridge took up the matter with enthusiasm and laid down a course with a minimum of six months training, followed by an examination of sufficiently searching a nature to exclude the dilettante. The University insists upon a good grounding in the physics of radiography. No diploma of whatever nature can be regarded as more than a certificate implying that a candidate has learnt the elements of the subject, and for no other reason are they to be commended. The holder of a diploma in radiology is in a much better position to acquire experience than the man without it—that is the point to be remembered.

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clear and the selection of experiments is carefully made. The book naturally deals in adequate detail with those observations on respiration and on the blood-gases for which the school is famous, and it is satisfactory to have a connected record of the methods used. There are also chapters on the use of instruments for the investigation of the circulation, and on the secretion of urine and the movements of the alimentary canal. A few chemical methods, such as some of the important ones for determination of blood-sugar and urea, are included. To teachers and advanced students the book will be very useful, and it is regrettable that the equipment and technique involved preclude the carrying out of such exercises by the ordinary medical student. To the clinical research worker the book may, we think, show itself indispensable.

Collected Papers, Institute of Physiology, University College, London. Vol. XXI. Edited by ERNEST H. STARLING, C.M.G., M.D., Sc.D., F.R.S., Sir WM. M. BAYLISS, M.A., Sc.D., F.R.S., and J. C. DRUMMOND, D.Sc., F.I.C. 1923.

THE 45 papers which comprise this closing volume of a remarkable series, show the same high standard of excellence which has marked all the volumes of collected papers published during the time that Prof. Starling was the head of the University College Institute of Physiology. The papers fall roughly into three groups, corresponding to the direction of inquiry followed by each of the three professors who edit the collection. About half of the papers represent work on vitamins by Prof. Drummond and various collaborators, particularly Miss Katharine Coward and Dr. S. S. Zilva; these papers have contributed largely towards giving the Biochemical Department of this College a high status. Original work breaking some fresh ground is that by Drs. G. V. Anrep and R. K. Cannan on the metabolism of the salivary glands, and on the effect of alteration of blood reaction on the lactic acid concentration of the blood. An interesting paper on active hyperæmia is contributed by Dr. D. T. Harris. Prof. Starling and various collaborators contribute papers on the heart, and Sir William Bayliss, as usual, ranges over a wide field of subjects. This volume contains two of his papers on the effects of hæmorrhage.

Questions Actuelles de Biologie Médicale. By G. H. ROGER, Doyen de la Faculté de Médecine de Paris; Professeur de Pathologie Expérimentale et Comparée; Membre de l'Académie de Médecine. Paris: Masson et Cie. 1924. Pp. 194. Fr.16.

THE seven essays contained in this book represent the conclusions of some of the author's researches, part of which have been already published as separate papers. Among the subjects treated are the lipolytic and detoxifying action of the lungs, various effects of injection of autolytic products of the lungs and of other animal extracts, the functions of the suprarenals especially with regard to their relation to the hypertension of cerebral embolism, the action of the liver on toxic substances, various researches on enzymes, and a chapter on the functions of the bile. This last is one of the most interesting in the book; one of the hypotheses advanced is that the bile counteracts an enzyme mucino-coagulase, and so inhibits the coagulation of mucin. In muco-membranous colitis, for one reason or another, coagulation of mucus occurs. As a whole the book provides highly entertaining reading, and one leaves it with a feeling of admiration for the author's ingenuity.

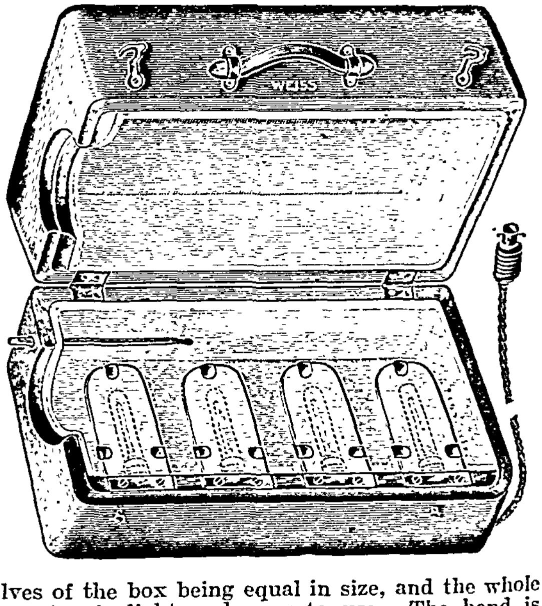
DIET FOR CHILDREN.
By CECIL WEBB-JOHNSON, M.B., Ch.B., Major R.A.M.C. (T.F.), late Civil Surgeon and O.C. Station Hospital, Dum-Dum. London: Mills and Boon. 1924. Pp. 128. 3*s.* 6*d.*

IT is not necessary to agree with their contents in entirety to find that Dr. Cecil Webb-Johnson's various works on diet contain much good common sense, so that their appeal to the lay reader, for whom they are intended, is justified. This is in many ways the best of his books; it shows a balance and a tolerance of opinions current among authorities on the scientific side of diet which have not always marked his previous works. He is still averse, though not so bitterly, to the use of milk. Though it would be easy to find fault with the scientific aspects of the book, it is one which is capable of being understood by those with no knowledge of science, and is likely to do much more good than harm.

New Inventions.

SPECIAL BOX FOR THE RADIANT HEAT TREATMENT OF INFECTED FINGERS AND HANDS.

THE use of radiant heat in treatment of infected fingers and hands has been mentioned by several authors,[1] and Messrs. John Weiss and Son have made a special box to my design for the hot-air treatment of such cases. The box is made of wood and is lined with asbestos and measures 13 in. by 10 in. by 7 in. Four long cylindrical carbon filament lamps give the heat and they can be supplied at the desired voltage. They are shaded by strips of asbestos to prevent any possibility of the lamp touching and so burning the hand. A thermometer has been fixed into the top of the box, so that the reading may easily be checked. The illustration shows the arrangement, the two halves of the box being equal in size, and the whole apparatus is light and easy to use. The hand is placed in the box, which is then shut and securely fastened, and any gaps left around the wrist at the entrance to the box are closed with wool or a towel. The current is switched on and the temperature allowed to reach 120° F.—which it does in five minutes—and it is then kept at that level for 20 minutes. The advantages of this box are that it provides a small, light, portable heat-bath for the hand, that it can be used anywhere where electric current is installed, and it provides a method which gives admirable results in clearing up infections of the hand and preventing adhesions of tendons and stiff hands.



R. M. HANDFIELD-JONES, F.R.C.S. Eng.,
Assistant Director, Surgical Unit, St. Mary's Hospital, London, W.

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[1] See THE LANCET, 1924, i., 966.

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Experiments lasting over several generations of rats, such as those carried out by W. CRAMER and published recently in our columns,[1] seem to indicate that slight deficiencies may become cumulative when they are allowed to last over several generations. For such experiments the rat is a particularly suitable animal because it is short-lived, and several generations can be submitted to experiment in two years. It has also the advantage of being omnivorous.

Another difficulty in experiments on nutrition arises from the fact that observations made on one species do not necessarily apply to other species in every detail. Obviously, carnivorous animals such as dogs differ in their metabolism from purely herbivorous animals. In a discussion on diseases of nutrition in the Section of Comparative Medicine of the Royal Society of Medicine some months ago,[2] Prof. E. MELLANBY maintained, as a result of experiments on dogs, that cereals, and especially oats, contained something of a toxic nature. He went so far as to suggest that on theoretical grounds the diet usually given to race-horses was not well adapted to produce fast runners. There is an old proverb that one man's meat is another man's poison, and it may be that what is oats for a horse is poison for a dog.

When we come to such laboratory animals as rabbits and guinea-pigs, with which Prof. LINTON does not deal in his present article, the general experience is that excess of greenstuff, together with oats and middlings or wheaten bran, is good maintenance ration. In an interesting paper, E. BROOK and J. TREVAN[3] showed two years ago that guinea-pigs fed on a diet of mangold, bran, and oats, suffered from an epidemic which was due solely to the diet and could be counteracted by adding fresh greenstuff to the diet. Rats do well on a diet of bread and milk with the occasional addition of raw carrots, greenstuff, or kitchen scrap. Oats do not seem to agree with rats, at any rate they do not readily eat them, while mice thrive on them if they are given together with bread and occasionally a little greenstuff.

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ANTHELMINTICS.

DURING the last few years a vast amount of research has been published on the therapeutics, pharmacology, and chemistry of anthelmintics. Most of this is in connexion with the recognition of the great importance of hook-worm infestation in tropical countries and the necessity for a systematic campaign against it. Oil of chenopodium is the drug chiefly employed for this purpose. It is certainly effective against hook-worms, but its toxicity is rather high and the danger of this is increased by its variable composition. It was suggested by HALL and HAMILTON[4] that the toxicity of chenopodium oil was due chiefly to the less volatile fractions which contain a large proportion of an organic peroxide known as ascaridol, and that the more volatile fractions were found more efficient as an anthelmintic. They therefore suggested that it might be advisable to distil the oil and use only the more volatile fractions for therapeutic purposes. The work of HENRY and PAGET on the chemistry of chenopodium oil,[5] in conjunction with that of Dr. SMILLIE on its pharmacology and therapeutics,[6] shows, however, that the opposite is the case. The more volatile portion of the oil consists chiefly of terpenes of which cymene and α-terpinene are the more important, and the anthelmintic properties are attributed almost entirely to the ascaridol, the chief constituent of the less volatile fraction. This ascaridol is said to surpass the crude drug in safety and certainty of action. The reason of the discrepancy between these results and the previous work of HALL and HAMILTON is probably to be found in the instability of ascaridol on heating. If the distillation of the chenopodium oil is carried out at an insufficiently low pressure, there is a danger of decomposing the ascaridol so that the anthelmintic power of the oil is seriously impaired. In commercial samples of the oil thermal decomposition of the ascaridol may have taken place, and this may account for the wide variations observed in the ascaridol content (36–98 per cent.). In view of the dangers and toxicity of oil of chenopodium, some South American practitioners have abandoned its use altogether, while others suggest that it should only be administered when there are ample facilities for studying the case before and after administration. In this respect β-naphthol and thymol are advantageous, as they are readily obtained in a chemically pure condition, and though their anthelmintic power is considerably less than that of chenopodium oil or ascaridol, this is to some extent counterbalanced by their lower toxicity to the host and by the greater facility for exact dosage.

Recently, however, carbon tetrachloride has found a rapidly increasing favour in the treatment of hook-worm disease and threatens to replace oil of chenopodium, thymol, and β-naphthol for this purpose. Although it is definitely and strongly toxic, the balance of opinion appears to be that the therapeutic dose is safely below the danger-point. As it can be obtained in a comparatively high degree of purity it does not suffer, like chenopodium oil, from the defect of variable composition and uncertain dosage. Purity is an important essential, as impurities such as carbon bisulphide and phosgene are excessively toxic, the latter, in fact, being more poisonous than prussic acid. It is doubtful whether carbon tetrachloride acts as a true anthelmintic; more probably its action on the worm is that of a narcotic. On account of its poisonous action as an inhalation anæsthetic it should always be administered in hard gelatin or similar capsules so that it is liberated only in the intestines. It is claimed to be more efficient than chenopodium oil in the treatment of hook-worms and thread-worms. Although carbon tetrachloride has acquired a considerable vogue in the treatment of hook-worm diseases, its extreme toxicity should not be forgotten, and its action on the kidneys is a delayed one, so that it can hardly yet, in view of its short history, be regarded as a completely tried and safe drug. The economic factor has no doubt played a considerable part in its use for the wholesale treatment of hook-worms, as it is far cheaper than oil of chenopodium or thymol. It is probably this economic factor which has prevented a trial of santonin for the treatment of hook-worm disease. There appear to be no reports as to its action on these parasites, which is to be regretted, as it would be of great interest and scientific value to compare its action with that of chenopodium oil and carbon tetrachloride. Although its price at the present time might prevent its use in the large quantities required for this purpose, it, may, at some future date, be more readily available. For the ordinary round worms and thread-worms santonin is still the classical remedy. It has the advantage of being a definite chemical compound obtainable in a pure state, and hence capable of accurate dosage, and it differs from the great majority of anthelmintics in not being a gastro-intestinal irritant, so that it is specially useful where repeated doses of an anthelmintic are indicated.[7] Its toxicity is small compared with its therapeutic power, although the personal idiosyncrasy seems to vary a good deal, as it also does in the case of chenopodium oil. From experiments on worm musculature, the anthelmintic action of santonin is attributed by LAUTENSCHLÄGER[8] and by TRENDELENBURG[9] to the lactone ring in conjunction with the aromatic nucleus, open chain lactones being inactive. They found that simple cyclic lactones such as phthalide and meconin were as active as the more complex santonin, but there is no evidence that these simpler lactones are of any therapeutic value, and experiments on the muscles of non-parasitic worms are not a very safe guide to anthelmintic value. Very careful and elaborate experiments of this kind were made on earthworms by SOLLMAN,[10] but these and the experiments of LAUTENSCHLÄGER and TRENDELENBURG do not indicate the specific action of anthelmintics over certain worms, and therefore cannot explain, for example, why santonin is active against round worms and not against tape-worms, while male fern is active against tape-worms and not against round worms. Recently, a preparation called santoperonin was introduced, which claimed to be chemically analogous to santonin and to male fern, and to possess the therapeutic properties of both, but actually it has not the least chemical resemblance to either of them, and its anthelmintic and therapeutic properties are extremely doubtful.[11] As a remedy against tape-worms the so-called pelletierine tannate seems to be the best. It is not a definite chemical compound but is the precipitate obtained by the action of tannin on the extract of pomegranate bark, and is therefore a mixture of the tannates of the various alkaloids present in the bark.

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[1] THE LANCET, 1924, i., 663.

[2] THE LANCET, 1924, i., 229.

[3] Biochem. Jour., vol. xvi., p. 780.

[4] Jour. Pharm. and Exp. Therap., 1918, xi., 228–260.

[5] Jour. Chem. Soc., 1921, cxix., 1714–1724.

[6] Bul. Soc. Med. e Cirug. de S. Paulo, Brazil, 1922, vi., 331–342.

The pharmacology of these anthelmintics is still in a very undeveloped state. Most phenolic substances, for example, have some anthelmintic action, and this is not surprising in view of their irritant and toxic character. Any irritant or toxic substance probably has some anthelmintic action, and if unabsorbed by the gastro-intestinal tract might have some therapeutic value, but it would not be a specific anthelmintic and would be therapeutically inferior to drugs such as santonin, male fern, and pelletierine. Carbon tetrachloride probably acts as a general poison in this way. With regard to santonin, two conflicting views are often quoted without comment in text-books of pharmacology. According to SCHROEDER, santonin expels round worms without killing them, and according to KUCHENMEISTER it kills them more rapidly than any other drug. This apparent discrepancy is probably due to the insolubility of santonin. In conjunction with oil, such as castor-oil, as in the experiments of KUCHENMEISTER, sufficient is apparently dissolved to kill the worms, whereas the minute trace dissolved in the absence of oil (SCHROEDER) is sufficient to expel the worms without killing them. From this it appears evident that santonin is a true anthelmintic with a specific action on the round worms. The same may be said of male fern and pelletierine. in respect of tape-worms, a concentration of 1 in 10,000 of pelletierine killing tape-worms in ten minutes. When it is realised how resistant these parasites are to most anthelmintics, this specific action is the more remarkable, and further investigation as to its mode of action would be of the greatest interest.

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[7] M. C. Hall: Studies on Anthelmintics, ix.
[8] Ber. Deuts. Pharm. Ges., 1921, xxxi., 279–291.
[9] Arch. Exp. Path. und Pharm., 1915, lxxix., 190.
[10] Jour. Pharm. and Exp. Therap., 1918, xii., 129–171.
[11] Report State Inst. Pharm. and Therap., Leyden, vi.

Annotations.

"Ne quid nimis."

ANNUAL MEETING OF THE B.M.A.

THE annual representative meeting of the British Medical Association opens to-day, Friday, July 18th, in the Examination Hall of the Technical College of Bradford, under the chairmanship of Dr. R. Wallace Henry. The printed agenda, which runs to nearly 150 items, includes such matters as indirect methods of advertising, legal liability in medical certification, and contributory schemes for private insured persons, which give promise of vigorous and profitable discussion. This meeting is expected to remain in session until Tuesday, July 22nd, when it is followed by the annual general meeting, at which the outgoing President, Mr. C. P. Childe, will induct his successor, Mr. J. Basil Hall, consulting surgeon to the Royal Infirmary, Bradford, who will then deliver the presidential address. The scientific sections will then meet concurrently on Wednesday, Thursday, and Friday, July 23rd–25th, and interesting subjects are set out on the provisional programme. The Section of Medicine, for instance, will take up cardiac irregularities, jaundice, and small-pox; the Section of Surgery will discuss acute osteomyelitis, pulmonary embolism, and auricular fibrillation; the Section of Pathology will have before it tissue culture, non-specific immunity, and protozoal intestinal affections. The annual dinner of the Association will take place at the Midland Hotel, at 7 P.M., on July 24th. A popular lecture on the Sun Cure will be delivered in the Mechanics' Institute by Sir Henry Gauvain on the evening of Friday, July 25th. The exhibition of surgical appliances, foods, drugs, and books, to be opened on July 22nd in the Windsor Halls, will give opportunity to members of the medical profession to see for the first time a number of new and ingenious inventions. The closing day of the meeting, Saturday, July 26th, has been set apart as usual for a variety of attractive excursions. The hon. local general secretary of the meeting is Dr. W. N. West Watson, Victor Lodge, Manningham, Bradford.

THE MEDICAL LESSONS OF A WAR.

THE last volume[1] of the Medical History of the Great War, which has just reached us, brings to a close a well-planned and quickly executed piece of valuable medical historical research. This volume merits the praise we gave to its predecessor[2]; it is a wonderfully clear statement of events as they occurred, compiled from a multitude of often conflicting reports from units involved in complicated and confused operations. It deals with many expeditions, each with its own trials: Gallipoli with its flies, the lack of water, and few hospital ships; Macedonia with malaria, mountains, and no roads; Mesopotamia with want of plan, and shortage of personnel and equipment; East Africa with its rain, tropical disease, and no natural main line of communications; Persia with its distance, its strange diseases, and thousands of refugees to feed, treat, and keep from spreading epidemics; Russia, a problem of swamps, snow, and uncertain allies. One outstanding lesson of this volume is that when an expedition is undertaken without careful consideration the first person to suffer is not the neglectful staff officer, though he may be brought to book later on, but the fighting man himself, who, because the medical corps has not been invited, nor given time, to do the best for him, gets unsatisfactory water or food when he is well, and not enough bearers or hospitals when he is sick or wounded. Were the staff, on active service, to take medical officers more into their confidence, telling them where and when the battle was to be, the wounded might be more quickly, more comfortably handled.

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[1] History of the Great War. Medical Services. General History. Vol. IV. By Major-General Sir W. G. Macpherson, K.C.M.G., C.B., LL.D. London: H.M. Stationery Office. 1924. Pp. 711 + xvi. 25s.
[2] THE LANCET, May 24th, 1924, p. 1060.

All the Regular officers of the R.A.M.C. as they read this book will realise how great is their responsibility, for on them hinges the evacuation of the wounded, and it is they who must firmly claim, from those above them, the personnel and material, the transport, sanitary sections, or what not, without which they cannot do their best for the soldiers trusted to them. Sanitary sections should accompany the very first troops of any expedition; they prevent diseases. Civil practitioners will find (at p. 601) that army doctors are not doing surgical operations all the time, but that the most useful service a medical officer may have within his power to do for the sick may be to see how many of 300 camels he can get to a particular place and where each camel will be able to take two wounded to hospital, for every camel lost means two wounded delayed. The last chapter on transport by stretcher and ambulance is a record of wonderful ingenuity, evoked by the vastly different conditions of the various theatres of the war. In France the wounded were removed in trench stretchers, in the mountains of Macedonia in travois, camels carried them in Palestine, sand carts in Sinai, country boats and river steamers in Mesopotamia, hammocks in East Africa, sledges in Russia. Trains and motor ambulances were always the most desired, but horse-drawn ambulances, with teams of four horses, still proved of value, for they can travel over fields and rough ground cut up by shells, where no motor ambulance can move. Air transport of wounded is not mentioned, although we are told of a medical officer who was carried some hundred miles in a seaplane in Russia to see a patient. An unexpected discovery of the war was the particular suitability of the educated native of Uganda for work in the medical corps. Enlisted mainly from the mission schools, and subsequently given the status of soldiers, a thousand of them were employed in small parties from Abyssinia to Durban; their non-commissioned officers were found fit to be put in charge of large groups of porters in a native hospital. Praise is also given to the undaunted conduct of an Indian field ambulance at Gallipoli, of the Egyptian camels and their drivers on the Sinai desert, and to the travois mules in Macedonia, all unperturbed by shell fire. The maps and pictures in the volume are most helpful; the statistics of illness would be more enlightening if in every case the numbers were given of the troops to which they refer.

The volumes, indispensable as they are, are too many for any officer to carry in his kit. A short but pregnant résumé of the series, a sort of Medical Officers' Pocket Book, would serve to make the lessons of the last war, often so hardly learnt, available to those who will have to struggle with the difficulties of the next. Details may then be different, but principles must still count.

AN ENGLISH-SPEAKING OPHTHALMOLOGICAL CONVENTION.

IT has been decided by the Ophthalmological Society of the United Kingdom and its affiliated societies to hold in London next year a Convention of English-speaking ophthalmological societies and associations, and invitations have been issued to the presidents of all such bodies in the different parts of the British Empire and the United States of America asking them to appoint official delegates or representatives on the occasion. The date suggested is from July 14th to July 17th, inclusive, and the Convention will be inaugurated by a reception given by the President and Council of the Royal College of Surgeons of England at the College on the evening of July 13th. The programme for the four days' work has been already arranged. Each morning, two afternoons, and one evening will be occupied in the scientific work of the Convention. The Bowman Lecture will be delivered by Sir John Parsons, the chairman of the committee for scientific business and publication, there will be a discussion on the microscopy of the living eye, and selected speakers will also take part in a debate on the evolution of binocular vision. The rest of the time will be taken up by visits to various institutions of ophthalmological interest, while receptions have been arranged, a banquet and a garden party. Those taking part in the Convention who are not members of the Ophthalmological Society will pay a fee of £2, while for ladies accompanying members of the Convention, who wish to become associate members, the fee will be 10s. The President of the Convention is Mr. E. Treacher Collins, who can be addressed at 17, Queen Anne-street, London, W. 1.

THE STANDARDISATION OF DYSENTERY SERUM.

THE therapeutic value of antidysenteric serum is not a subject upon which anyone who had experience of epidemic dysentery during the war will have any doubts. Where serum was freely used excellent results generally followed. In most cases a polyvalent preparation was employed, and it is more than probable that had any monovalent serum been available even better results might have been obtained, since there is no definite evidence that the different types of dysentery bacilli produce a common and unique toxin. The standardisation of dysentery serum is a matter of some difficulty, and at the present time we are far from the realisation of the same accuracy of titration which is possible for diphtheria and tetanus antitoxins. The difficulties are both that of technique and that of inadequate information. We are unable to produce the same sharply marked animal results as with the two last-mentioned infections, and knowledge is hazy as to the undoubted toxicity of the dysentery bacillus. A recent work from the Kitasato Institute of Japan, published under the auspices of the League of Nations,[1] has made an attempt to narrow down the issues in this field, and to clarify the principles of the standardisation of dysentery serum. The authors of this paper concern themselves solely with the Shiga variety of bacillary dysentery, and as a first step towards the end in view have endeavoured to find out the best way of preparing a potent and stable dysentery toxin. They find that in broth cultures the toxicity rises pretty sharply for a couple of weeks and thereafter falls off again, the development of maximum toxicity corresponding to the development of a late alkalinity of the medium which reaches its maximum at about the same time as the toxin content. The toxin thus prepared is fairly stable, but by no means absolutely so. Its toxicity is well marked, 0·05–0·1 c.cm. being generally fatal to rabbits. It does not, however, appear to be as toxic as is an autolysed extract of the bacterial bodies. Having obtained adequately toxic preparations for the estimation of the protective powers of antitoxins, the authors proceeded to compare antisera prepared by the injection of a number of preparations. The experiments are not sufficiently numerous to give convincing results, but, with this proviso, it appears that serum obtained by injecting horses with fresh cultures of dysentery bacilli, suspended in saline, is likely to be more potent than that prepared by the injections of sterile toxins and broth cultures, both of which are more lethal to the animals than is the first-named preparation.

The actual standardisation of antitoxin was found to be fraught with great difficulties, not the least being the wide variation in individual susceptibility met with in the rabbits upon which the experiments were made. For example, one animal may be capable of withstanding several times the dose which is fatal to another animal of the same weight. In consequence of this the usual procedure of estimating the smallest amount of antitoxin required to neutralise a lethal dose of toxin was inapplicable and recourse was made to the method of estimating how much antiserum might be added to 20 average lethal doses of toxin without inhibiting its effect. In this way an estimate of the weakness of the serum is made rather than its strength. In spite of such modifications difficulty in making an exact estimation of the potency of the serum exists, although for practical purposes relatively accurate figures may probably be obtained. An attempt is made to separate the antibacterial and antitoxic powers of the serum, but with no very definite results, and it appears clear that further investigations are required to elucidate these two factors and the parts they play in the pathogenicity of *B. dysenteriæ*. It is interesting to note that the bacterial factor is the one most favoured for antiserum production, whilst a toxic filtrate is used in the estimation of serum potency. It would be well if more light were thrown upon the unity or individuality of these two factors. A further report upon the application of the findings of this first investigation to the standardisation of serum on a commercial scale is to be presented, as also are the results of its clinical employment.

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[1] The Standardisation of Dysentery Serum. League of Nations, Health Organisation. First report by Kiyoshi Shiga, M. Kawamura, and K. Tsuchiya. The Kitasato Institute for Infectious Diseases, Tokyo, Japan. Geneva. 1921.

INSANITY AND ART.

COMPARATIVELY few people know that lunatics paint pictures, hold their own exhibitions, and even have their work hung at the Royal Academy. These and many other interesting facts were told to the Art Lovers' League by Dr. T. B. Hyslop at Leighton House on July 8th, in a lecture entitled Disease in Modern Art. Dr. Hyslop, an artist as well as an alienist, confined his remarks almost entirely to the work of certified lunatics and showed a remarkable series of slides prepared from pictures which he had collected at Bethlem Hospital. Many of these illustrations showed no signs of disease, while others were mere jumbled masses representing people and other objects. One patient produced quite pleasing studies, but left out the faces of all his models. The progress of cerebral lesions was demonstrated in several sets of pictures. In one all objects became gradually more and more elongated, while in another the artist started by cutting the corners off his paintings and finally drew everything in circles which slowly diminished in size. At the close of his lecture Dr. Hyslop presented his valuable collection of lunatics' pictures and lantern slides to the Art Lovers' League.

CARE COMMITTEES FOR THE TUBERCULOUS.

THE Need and Organisation of Care Committees was the subject discussed at the final session of the Tenth Annual Conference of the National Association for the Prevention of Tuberculosis reported in our last week's issue. Lieut.-Col. J. A. Ellis, B.Sc., who had undertaken to collect for the Association all available data on this subject, pointed out that in many areas the whole of the tuberculosis service was in the hands of a solitary tuberculosis officer, who would welcome the formation of a care committee. Neither he nor the general practitioner could undertake to go out looking for disease. As many cases came under observation at a late stage enlightenment and education of the public were required, and the local authority should provide not only sanatoriums for suitable cases but also accommodation for advanced ones. The problem is not so difficult in a self-contained community like a county borough or a town as in rural areas. In one area the local authority gives 25 per cent. additional to all money collected by voluntary subscription. The care committee should not be too insular nor should it avoid publicity. The personnel of the committee should be comprehensive and the principles guiding its activities should be both social and economic—the physical requirements in the home; education in hygiene, personal and communal; distribution of extra nourishment and clothing; coöperation with existing organisations, such as the National Health Insurance, War Pension Committees, &c., and the finding of employment—all these activities might be undertaken by care committees. In short, all anti-tuberculous work should be extensive, intensive, continuous, and timely; the advantages of publicity should not be neglected. A national survey of certain areas on the lines of the Framingham experiment[1] was recommended.

The discussion laid bare several difficulties of organisation. For example, to obtain information as to the existence of tuberculosis in a family among whom it is desired to place a child is not easy; to persuade employers to find work for the tuberculous is even harder. This is not surprising, for healthy men do not like working alongside the tuberculous for fear of infection. The dangers of asking too many questions and thus arousing hostility were emphasised by one speaker, and of conducting public health propaganda directed against one disease alone by another. Dr. Macdonald (Battersea) explained that in many places the care committee is a separate entity, divorced from the dispensary instead of being an indispensable part of it. His view was that if the care committee and the dispensary were adequately staffed, and one paid secretary acted for both, better coördination would result. Some speakers highly commended the work done by the care committee; others praised the good services of the health visitor, and held that money should be spent on the extension of this aspect of the work rather than on care committees. Adequate representation on every care committee, of friendly societies and of trade-unions, and a closer coöperation between medical and lay members was one of the suggestions made for increasing the value of these committees, which we can heartily endorse.

HEALTH IN THE COTTON INDUSTRY.

THE 1923 report of Dr. W. A. Daley, the medical officer of Blackburn, draws attention to the health of operatives in this centre of the cotton industry. Blackburn comes out well in comparison with other towns in housing matters; of 31,425 separate dwellings, 30,405 were occupied by one family only, and the percentage of persons living more than two to a room was the lowest in the county. The proportion of females to males, 1197 to 1000, is the largest of the industrial towns of Lancashire. During the last decade the total population has decreased; between 1911 and 1921 the number of male textile workers declined from 15,896 to 11,701, and of female from 25,913 to 24,999. One of the changes which has taken place is the increasing employment of married women in the cotton mills. Their numbers have risen from 9448 in 1911 to 9684 in 1921. Blackburn now has a larger proportion of married women industrially employed than any other Lancashire town—viz., 56 per cent. of those under 44 years of age and 22·9 per cent. of those over 44 years. Like other towns where married women are extensively employed in the factories, Blackburn has a low birth-rate, a high neonatal and infant mortality, and it is one of the towns specially referred to in Dr. Janet Campbell's recent report as showing year by year a very high mortality among mothers due to child-bearing. The number of stillbirths is also high, the rate for 1923 being 5·4 per 1000 registered live births, as compared with the average for the county of about three. Dr. Campbell says that return to work after the birth of a child is not as a rule long delayed, and that there is comparatively little breast-feeding. Rickets, she says, was very prevalent 20 to 40 years ago, and contracted pelvis is not uncommon in women from 20 to 40 years of age. It is not surprising to find that Dr. Daley associates the high maternal mortality from childbirth with the employment of so many married women in industrial occupations. It would seem likely that the high stillbirth-rate and the high death-rate of infants under one month and one year are due to the same cause. There is no need to labour the point that a low rate for breast-feeding means a high infant mortality-rate.

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[1] See THE LANCET, 1924, i., 1243.

Another point affecting the health of the cotton operatives dealt with by Dr. Daley is of very great interest—namely, the effect on health of artificial humidity. He has been unable to compare the health of two populations of cotton operatives living and working under similar conditions with the one exception of the provision of artificial humidification of the work-place. Dr. Daley has, therefore, done the best he could by comparing the death-rates among various classes of cotton operatives who live in Blackburn and are subject to the same environmental and general conditions of life outside the mill. He divides the operatives into four classes—viz., weavers, spinners, winders and warpers, and card-room workers. Recent figures show that female weavers have the best vital statistics. The conclusion to be drawn from the figures, says Dr. Daley, is "that, *so far as the death-rates show, weaving in humid* sheds such as there are in Blackburn is healthier than the other branches of cotton manufacture as carried out in this town." This result is somewhat surprising in view of the teaching of Prof. Leonard Hill which is now being generally accepted. Dr. Daley suggests no explanation beyond the conjecture that the result may be due to the small amount of dust which is to be found in these humid atmospheres.

THE VAGARIES OF SURGICAL TUBERCULOSIS.

In the paper by Mr. R. V. Dolbey and Mr. A. W. Mooro, published in THE LANCET of June 7th, there is much evidence to show that surgical tuberculosis among the Egyptians differs considerably from the disease as we know it in this country. Tuberculosis in general—surgical tuberculosis in particular—is the greatest scourge in Egypt, and among the poor urban population 80 per cent. of the gross tuberculous disease of the bones, with abscesses and mixed infection, terminate fatally. As a rule, the disease takes about 18 months to kill. Little wonder therefore that amputation is regarded in Egypt as the safest and best functional operation for mixed infections of the limbs. If we compare this paper with one recently published by Mr. G. R. Girdlestone,[1] it is impossible to avoid the conclusion that not only does tuberculosis vary greatly in its behaviour in different countries, but that even the elementary principles underlying the treatment given in different institutions show a remarkable lack of uniformity. Does this lack of uniformity credit us with a versatility that is appropriate to a disease itself infinitely varied in its manifestations, or must we confess that the polymorphism of our treatment betrays ignorance of the fundamental requirements of the sufferer from surgical tuberculosis? It is exceedingly difficult to compare the merits of different treatments by the results obtained, for "results" are usually published too early and, as Mr. Girdlestone points out, "a cure in one hospital's register may be a very sick patient in another hospital's bed." In surgical, as well as in pulmonary tuberculosis, there seem to be differences of opinion as to the respective merits of mobilisation and immobilisation, and while Dr. Rollier of Leysin aims at mobility, many English surgeons are thankful if they can obtain immobility with permanent arrest of the disease. Again, in the matter of cold abscesses, Sir Henry Gauvain at Alton aspirates frequently and often injects alterative fluids, whereas Dr. Rollier and Mr. Girdlestone aspirate a cold abscess only when it threatens the skin. Many other instances could be given of divergencies of teaching in the most prominent tuberculosis centres throughout the world, and one may be inclined to suspect that the decline in the incidence and severity of tuberculosis in many civilised communities at the present time may not be solely due to the almost infinite ingenuity of man, but also to factors over which he has a very limited control. It is, indeed, almost impossible to avoid this conclusion when we compare the fate of the average patient in Egypt with that of his fellow sufferer in certain European countries.

THE LATE PROF. R. W. LOVETT.

We have already had occasion to chronicle the death in this country of Prof. R. W. Lovett, of Boston, U.S.A. Robert Williamson Lovett was born in 1859, and was a graduate both of Harvard College and the Harvard Medical School. At a comparatively early age he was appointed to the junior surgical staff of the Boston Children's Hospital, and for a time acted in a similar capacity at the Boston City Hospital. The latter association was a passing phase; it was the children's hospital which provided him with those special opportunities which he was to utilise with such great distinction. At the hospital Lovett was for some years the junior colleague of Dr. E. G. Bradford, who occupied the position of surgeon-in-chief, and who was first responsible for the somewhat revolutionary move of dividing the surgical side of the hospital into two services—one dealing exclusively with orthopædic surgery and the other embracing what was left over, and for want of a better term labelled "general surgical." This was the real beginning of the now renowned Boston school of orthopædic surgery, which was fortunate enough to earn local recognition at an early date in the form of the creation of a professorial chair in this subject at Harvard. Lovett succeeded to the chair after the retirement of Bradford, and continued to add to the prestige given it by his most distinguished senior colleague. Their names were inseparably coupled in the many activities concerned with the growth of a special surgical school. and particularly in connexion with the well-known text-book of orthopædic surgery which they published in the early 'nineties. When Lovett attained the rank of surgeon-in-chief to the Boston Children's Hospital he soon became its most dominant figure, and his influence and leadership were manifested in the wider spheres of hospital organisation, the affairs of the Harvard Medical School, and of American surgery. He was the absolute antithesis of the hospital surgeon endowed with technical ability and little else; his achievements emphasised again and again the futility of appointing to high executive positions either the pure craftsman or the academic scientist. Two years ago, when Lovett was prepared to relinquish the arduous duties of his hospital and teaching chair, it was felt that he could not be allowed to retire altogether as he was then at the zenith of his experience, influence, and power. His successor, Dr. R. B. Osgood, was appointed to both offices, but the chair was duplicated and the professorial title was still held by Lovett at the time of his tragic death. Lovett was a fine clinician and teacher and, above all, a master organiser. As an operator he was not naturally dexterous, but he took infinite pains and care with each operation, no matter how small, and thus was able to obtain very good results. It was his custom to pick out from time to time a series of cases of a given type and to operate on these himself, the experiences forming the basis of future critical pathological or end-result studies. But he distributed the large share of the operative work of his clinic to his associates. In consequence he was able to attract and—more important—to retain on his staff a group of comparatively senior men to whom he accorded a large measure of anatomy. In this respect he was the great surgical "Meister," but—happily for his associates—not in the accepted continental sense of the term. The communications to the literature of orthopædic surgery which have emanated from the Boston Children's Hospital bear witness to the strength of this type of surgical organisation. Lovett's own personal contributions were many and varied, but on the subject of scoliosis and infantile paralysis his knowledge was unrivalled. He began his observations on scoliosis many years ago, and he never lost his interest in a problem which to many has always seemed arid and, from a therapeutic point of view, insoluble. His monograph on this subject is, of course, classical. In 1916, when the epidemic of acute anterior poliomyelitis first assumed devastating proportions in certain of the Eastern States of America, Lovett's active mind at once turned from the conventional problem of the individual deformed patient of the later stages to the handling of patient en masse at the inception of the disease, with a view to the complete prevention of deformity. In the State of Vermont he was officially placed in control of the cases as they occurred, and early and correct treatment was instituted on a large scale. The Harvard Infantile Paralysis Commission was later organised to deal specially with adults attacked by this disease. From this unique clinical experience our knowledge has been enriched in a number of contributions published during the past few years and crystallised in the chapter on infantile paralysis in the great text-book which Lovett issued last year in collaboration with Sir Robert Jones, at whose house he died. Our sense of personal loss is heightened by the remembrance of Lovett's generosity in affording opportunities to some of the younger British surgeons of working in his clinic at Boston.

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[1] Tubercle, July, 1924.

IT is announced in Army Orders that with effect from April 1st, 1925, the examination of majors of the Royal Army Medical Corps for promotion to lieutenant-colonels will consist of a written examination in army medical organisation and administration in peace and war, and of a medical staff tour.

A DANISH seaman with a black skin has recently been the subject of a very thorough investigation at Guy's Hospital. The condition which, although very rare, has been the object of previous study, is characterised by (1) exfoliative dermatitis, with progressive pigmentation of the skin; (2) intense hyperidrosis; (3) mental symptoms, of which delusions are the most frequent evidence. The mental condition of these patients impedes investigation of these cases in the wards of a general hospital.

Dr. David Murray Lyon has been appointed by the University Court of Edinburgh to be Christison Professor of Therapeutics in succession to Prof. J. C. Meakins, whose appointment as director of the medical clinic established through a grant of the Rockefeller Foundation in McGill University, Montreal, we announced recently. Prof. Murray Lyon was associated in his work with Prof. Meakins in the Royal Infirmary of Edinburgh, where he was appointed assistant physician in 1919.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

THE LANCET OF FEB. 2ND, 1924.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXX.—TREATMENT OF MYOPIA IN YOUNG CHILDREN.

IT is astonishing how deep-rooted are the prejudices and old fallacies about myopia in the public mind and often, unfortunately, in the minds of many practitioners as well. The commonest of these is that short-sighted people get better as they get older, and that therefore myopic eyes are very "strong." Both these fallacies arise from the fact that it is generally considered a sign of weakness to be compelled to wear glasses, and since the presbyopic correction after 45 counteracts to a certain extent the myopic correction, myopes at and after this age usually find that they are able to read without glasses. Such reasoning seems entirely to ignore the fact that the distant vision remains exactly the same as it was before and depends for its perfection on the use of distance glasses, by which alone the degree of myopia can be measured. These fallacies tend to encourage parents to be careless in bringing their children for advice, or in carrying out the treatment, while it leads the practitioner to hesitate in expressing his opinion and sticking to it. It is therefore vitally important to bear in mind the many causes which contribute towards the development of myopia.

Causation.

There are various factors in the causation of myopia, but the commonest, at any rate in children, is what is known as axial myopia or abnormal length of the eyeball. This is sometimes congenital, but more often develops during the earlier years of child life, and is liable to increase up to the age of about 22. This lengthening of the eyeball takes place at the posterior pole of the eye, and if this distension occurs either quickly or gradually there comes a point when the choroid and retina, which should normally be closely adherent to the posterior part of the sclera, become thinned, split, and finally rent to such an extent that gaps are formed in these structures and so-called atrophic patches are found at the macula; the stretching round the optic nerve gives rise to the myopic crescent and staphyloma, often a useful guide to the degree of progression. Thus the vision is seriously affected. Also in after life the vitreous is liable to become fluid, the change being due either to inherent changes in its structure or to some interference with the character of the fluid secreted by the ciliary body; this may lead to shrinkage, and thus detachment of the retina is liable to occur following any excessive muscular effort, and occasionally the lens becomes opaque and cataract develops. In my experience it is not common for such serious pathological changes to happen in young life, but the progression takes place at this stage and the pathological changes may develop later. The very fact that the eyeball bulges posteriorly is evidence of weakness of the scleral envelope, which is probably due to defective nutrition for reasons connected with the health, but the determining factors which contribute to this distension is a subject of some difference of opinion. Although many arguments can be advanced against it, the generally accepted view is that close application to near work for a length of time is largely responsible; owing to the fact that the extra-ocular muscles are attached to the globe they are liable to press on the eye when put into action. No movement of the eyes is a simple one, and in order to maintain the eyes in one position for any length of time many of the muscles jointly take part in the action and a sustained pressure is thus induced. Reading at near range results in such combined action, and the muscular tension, being imparted to the eye in the presence of a weak sclera, encourages the posterior pole, which is unsupported, to give way. It is doubtful whether accommodation has much to do with the production of myopia, but the irregular accommodation required in astigmatism may have some influence. Progressive myopia may occur without the patient being aware of it unless he wears glasses regularly.

The possibility of the occurrence of all these changes and possible influences must be present in the practitioner's mind when he approaches a case of myopia in a child, however remote the changes may be, or however unlikely they appear to be at the time of the examination.

Symptoms.—There are very few symptoms associated with myopia. There is hardly ever any asthenopia unless the short sight is associated with some muscle-balance defect, and practically the only complaint that patients make is that they are unable to see properly in the distance. This is by no means always the case, as many myopes will express themselves perfectly satisfied with their distant vision, and often object to wearing glasses on this account.

Management of a Case.

In children the refractive error should be carefully measured under a mydriatic, and the glasses ordered should be the lowest strength with which the patient can see 6/6 binocularly. It will be found that this represents a strength slightly lower than is accepted monocularly. In no case should a myope be over-corrected; this is a serious error. On the other hand, the old prejudice against ordering full correction in cases of myopia of any degree is entirely unjustifiable. This fallacy is founded on the assumption that full correction glasses necessitates a full amount of accommodation for near work and that this conduces to progression. But it is doubtful whether accommodation plays any part in the causation of myopia, and in many myopes the accommodation is certainly as strong as in emmetropes, though in several cases of high degree it has been proved to be atrophic. Many people are perfectly happy in full correcting glasses, while others describe various discomforts from wearing them which they seem unable to ignore or get accustomed to. Each case must be judged on its merits. I always encourage patients to begin with full correction; the strength can always be reduced later if necessary.

Glasses should be worn constantly by myopic children, as by this means their visual acuity is maintained at full normal (if 6/6 vision has been obtained); they quickly become aware of any departures from this standard and thus become conscious of the first signs of progression; whereas the changes in visual acuity at near range are not so noticeable, as the necessity for reading at a slightly shorter range than has been customary does not make any impression. Full correcting glasses also enable children to read at the most suitable distance (viz., 12 to 18 in.) which they otherwise might not be able to do, and this is much less straining for the eyes. No reading glasses should ever be ordered in young people unless it is proved on examination that they are unable to read J. with their glasses and yet can see 6/6. This indicates that the accommodation is weak, and under these circumstances reading glasses may be ordered temporarily; when the power of accommodation improves they can be discarded.

Very high myopes almost always prefer not to have full correction, and often are not comfortable except with three or four dioptres less, but even in such cases a trial with full correction should be made, and some patients are anxious to wear such glasses. The only objection is the heavy weight of the glass in the spectacle frame. Parents are often very averse to their children wearing glasses, and myopes themselves are particularly disinclined to use them, even though they realise that their visual acuity will be improved thereby. Under such circumstances the practitioner must remain firm in his opinion, especially in the case of children.

The general advice given to myopic patients is directed towards preventing the constant application of any kind of near work for any length of time. A proper form of desk for writing purposes should be advocated, so that the patient is compelled to sit up and keep at a reasonable distance; a good light is essential, so as to avoid the alternative of putting books and work close to the eyes in order to secure a larger image, and no small print or fine needlework is permissible for the same reason. Reading in bed is not bad in itself, but only because the position of the light is usually utterly unsuitable for comfortable reading; lying on the side only causes the eyes to be maintained in an abnormal position and necessitates the unnatural muscular action which is so bad for myopes. It is an important matter to discourage continuous application in reading and sewing, but to arrange for definite periods of rest alternating with periods of work.

In cases of definite progression, such as one or two dioptres in six months, the question of discontinuing all reading and school work has to be decided, and this becomes a serious matter in children who have reached an important stage in their education, but before taking this serious step all pleasure reading can be forbidden as a preliminary measure. Near work need not be curtailed merely because a patient has high myopia; it is the signs of progression that matter. It is of the greatest importance in all cases of myopia in children to pay particular attention to the general health, since the weakness of the sclera must not be lost sight of as one of the predisposing causes. When high myopia has become stationary reading may be permitted but physical over-exertion must be avoided, as in this way detachment of the retina is encouraged.

Malcolm L. Hepburn, M.D., F.R.C.S. Eng.,
Surgeon, Royal London Ophthalmic Hospital, and Ophthalmic Surgeon, Royal Free Hospital.

Special Articles.

THE MAINTENANCE RATIONS OF ANIMALS.

By R. G. Linton, M.R.C.V.S.,
DEPARTMENT OF HYGIENE, ROYAL (DICK) VETERINARY COLLEGE, EDINBURGH.

A maintenance ration may be described as that which will keep an animal that is in a resting non-producing condition and in good health in the same condition and at the same weight *for an indefinite period.* A diet that keeps an animal at a constant weight and *apparently* in good health for a short period is not necessarily a true maintenance ration. For example, certain monkeys kept in confinement in a zoo which are accustomed under natural conditions to a varied diet, including insects and grubs, may live for a considerable time in confinement on a diet of mixed fruits and nuts. When eventually these animals die, post-mortem examination not infrequently reveals a hitherto unsuspected osteomalacia, evidence that the diet has been deficient. It is therefore to be assumed that long before symptoms of illness became evident the animals had been living in a condition of "half-health," hence one would not be justified in regarding this diet as a maintenance ration, notwithstanding the fact that it does maintain life even to the extent of several years.

In connexion with the domesticated animals in many cases it is very difficult to say what really constitutes a true basal ration if it is agreed that the diet must maintain health for a long and not short period. There are many factors which have to be taken into consideration, any one of which, if neglected, may tend to lower the health-level of the animal. Every basal ration should be constructed so as to allow for sufficient exercise, as a certain minimum of exercise is essential if health is to be maintained. The writer, when feeding oats stained with methylene-blue to horses for the purpose of determining the rate of passage of food through the intestine, found that a few minutes' walking exercise round a yard caused the fæces to be evacuated several hours earlier than when the same animals were kept standing tied up in a stall. Dogs accustomed to regular exercise, and thus regular evacuation of the rectum and bladder, when kept confined in a cage fail to get rid of their waste products as soon as they should, and thus real health is not maintained. It is well known that cattle and horses when conveyed by ship, even for a short distance, show a gain in weight out of proportion to the amount of food they could have digested. This temporary increase in weight is due to the accumulation of indigestible food and waste products in the intestinal tract. This is a very important point to keep in mind when carrying out feeding experiments with animals confined in cages, for this delay in evacuation of residual matter, if continued for an appreciable period, is bound to have a detrimental effect on the health of the animals.

Requirements for a Basal Ration.

The requirements for a proper basal ration for animals may be summarised as follows: (1) The net caloric intake must be equivalent to the basal fasting katabolism, together with an allowance for the increased metabolism due to the specific dynamic action of the food consumed. (2) It must supply sufficient net energy for adequate exercise. (3) Additional metabolisable energy may be required simply for the purpose of supplying heat in the case of animals where the critical temperature is of practical importance. (4) There must be sufficient protein to equalise nitrogen outgo. (5) There must be sufficient "coarse" food in the ration to open out the concentrated food and thus allow the free access of digestive juices. (6) An adequate bulk to the ration is necessary to cause the optimum distension of the stomach and intestines necessary for proper digestion, and to give that sense of repletion without which the animal will not be contented. (7) The protein and non-protein constituents must be in proper proportion the one to the other, as also must the fat to the protein, for the optimum digestion of the food to take place. (8) There must be a properly balanced and sufficient mineral supply to ensure a normal ionic concentration. (9) The food must be suitable for the particular species of animal. (10) An adequate supply of vitamins is essential. (11) Finally, the food must be palatable.

Neglect to study the above points when formulating rations, especially when the object of feeding an animal is to conduct a feeding experiment, may be the cause of very misleading results, and it should be remembered that whilst animals possess a considerable flexibility in their capacity to utilise strange and unnatural foods, this power to acquire tolerance is not unlimited.

Maintenance Requirements of Horses and Cattle.

Maintenance requirements of farm animals are sometimes expressed in terms of *net energy*, which is equivalent to Kellner's production starch equivalent, or, on the other hand, in terms of *gross digestible energy*, which is equivalent to Armsby's *metabolisable energy*, or the so-called maintenance starch equivalent. The caloric value of 1 lb. of metabolisable energy expressed as starch is 1710 Kilo-calories (C.); that of 1 lb. of net energy expressed as production starch equivalent is 1071 C.

In accordance with our conception of a true basal maintenance ration, the requirements for the maintenance of a horse have been studied by many interested in animal nutrition. A critical study of the investigations that have been made to this end has been provided by Armsby in his "Nutrition of Farm Animals."[1] Armsby accepts the finding of Zunts and Hagemann, which is that for an animal weighing 1000 lb. there is required a total of 11,900 C. of metabolisable energy made up as follows:—

Net energy for internal work..	4,100 C.
Additional required for heat production	7,800 C.
Total metabolisable energy	11,900 C.

This caloric requirement is not taken to mean the physiological minimum but an economic minimum.

In 1917[2] I estimated the maintenance requirement for horses and, basing my calculations on a study of former investigations and on the rations given in practice, suggested that a total of 13,000 C. of metabolisable energy would meet the demands of a 1000 lb. horse—that is, a light draught horse—where the temperature of the surrounding air was not too low, and provided that the ration contained sufficient net energy for physiological purposes. It was also assumed that this 13,000 C. would allow for the minimum of exercise required to maintain health.

It would appear, however, to be very difficult, if, indeed, it is not even impossible, to fix with any high degree of accuracy the maintenance requirements of horses and to express them in terms of calories. This is so for two reasons: first, because there is such divergence between the findings of the various investigators as to what constitutes a maintenance ration; and, secondly, because we have but rudimentary knowledge of the real caloric value of the different foods for these animals, either when fed as single foods or in combination, as when a composite diet is given, as, for example, hay, straw, and grain. It is well known that the digestibility, and hence the net energy value, of foods varies according to the combination in which they are given.

When calculating the rations of horses, it has been commonly assumed that the same food has an equal value for both the ruminant and the horse, and though Kellner himself says that his "starch values" may be applied to both horses and ruminants, this is doubtful, at least with a number of foods. Indeed, Armsby gives a much higher value to some foods for the horse than he does for ruminants, so that as some people use Kellner's figures and some Armsby's, it is not surprising that conflicting results are obtained.

If we assume Kellner's deductions to be correct and that 6·6 lb. of "starch" will satisfy the demands of a resting horse weighing 1000 lb., then 16 lb. of "good" quality meadow hay will constitute a maintenance ration so far as its energy value is concerned, since this quantity of hay has a metabolisable energy of 12,483 C. and a net energy value of 5355 C. We know in practice that 16 lb. of hay is fully as much as an animal of this size could eat in a day. If we refer to any published tables of food values we find that, while it is stated that 16 lb. of "good" meadow hay has a net energy value of 5355 C., an equal quantity of "very good" meadow hay has a net value of 6954 C. So that here we have a difference of 1600 C. in a diet of 16 lb. of hay, according to whether the feeder classes it as good or very good. To illustrate still further what confusion exists regarding food values for animals and their application when an attempt is made to construct a diet on "scientific" lines, we may refer to an example of a maintenance ration for a bullock given by Prof. T. B. Wood in his recently published "Animal Nutrition."[3] On p. 169 Wood quotes Kellner's figure for the net energy value of barley straw at 209 C. per lb. and Armsby's figure at 366 C. per lb. Accepting the latter figure which, as he says, was determined much more recently, Wood considers that 17 lb. of barley straw will supply sufficient net energy for the maintenance requirements of a 9 cwt. bullock, that is, 6000 C. of net energy. (This ration is, of course, deficient in protein, as Wood points out.) In subsequent pages, when compounding rations containing barley straw for bullocks, Wood makes use of Armsby's figure, but in his table of food values leaves the agriculturist to construct his rations from Kellner's figure which is the one, rightly or wrongly, that is in general use. What this difference in values means is made clear when it is understood that if Armsby's figure is used then 16·5 lb. of barley straw will presumably supply the 6000 Calories required, and if Kellner's be utilised, then no less than 28·7 lb. will be necessary. If Armsby's figure is right then Kellner's must of necessity be wrong, and as dairymen have been in the habit of constructing "scientific" rations for their cows from Kellner's figures they will be accommodation has much to do with the production of myopia, but the irregular accommodation required in astigmatism may have some influence. Progressive myopia may occur without the patient being aware of it unless he wears glasses regularly.

The possibility of the occurrence of all these changes and possible influences must be present in the practitioner's mind when he approaches a case of myopia in a child, however remote the changes may be, or however unlikely they appear to be at the time of the examination.

Symptoms.—There are very few symptoms associated with myopia. There is hardly ever any asthenopia unless the short sight is associated with some muscle-balance defect, and practically the only complaint that patients make is that they are unable to see properly in the distance. This is by no means always the case, as many myopes will express themselves perfectly satisfied with their distant vision, and often object to wearing glasses on this account.

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In children the refractive error should be carefully measured under a mydriatic, and the glasses ordered should be the lowest strength with which the patient can see 6/6 binocularly. It will be found that this represents a strength slightly lower than is accepted monocularly. In no case should a myope be over-corrected; this is a serious error. On the other hand, the old prejudice against ordering full correction in cases of myopia of any degree is entirely unjustifiable. This fallacy is founded on the assumption that full correction glasses necessitates a full amount of accommodation for near work and that this conduces to progression. But it is doubtful whether accommodation plays any part in the causation of myopia, and in many myopes the accommodation is certainly as strong as in emmetropes, though in several cases of high degree it has been proved to be atrophic. Many people are perfectly happy in full correcting glasses, while others describe various discomforts from wearing them which they seem unable to ignore or get accustomed to. Each case must be judged on its merits. I always encourage patients to begin with full correction; the strength can always be reduced later if necessary.

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In cases of definite progression, such as one or two dioptres in six months, the question of discontinuing all reading and school work has to be decided, and this becomes a serious matter in children who have reached an important stage in their education, but before taking this serious step all pleasure reading can be forbidden as a preliminary measure. Near work need not be curtailed merely because a patient has high myopia; it is the signs of progression that matter. It is of the greatest importance in all cases of myopia in children to pay particular attention to the general health, since the weakness of the sclera must not be lost sight of as one of the predisposing causes. When high myopia has become stationary reading may be permitted but physical over-exertion must be avoided, as in this way detachment of the retina is encouraged.

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Special Articles.

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In connexion with the domesticated animals in many cases it is very difficult to say what really constitutes a true basal ration if it is agreed that the diet must maintain health for a long and not short period. There are many factors which have to be taken into consideration, any one of which, if neglected, may tend to lower the health-level of the animal. Every basal ration should be constructed so as to allow for sufficient exercise, as a certain minimum of exercise is essential if health is to be maintained. The writer, when feeding oats stained with methylene-blue to horses for the purpose of determining the rate of passage of food through the intestine, found that a few minutes' walking exercise round a yard caused the fæces to be evacuated several hours earlier than

380 g. of dog biscuit contains 63 g. of protein, it might be assumed that the biscuits by themselves would constitute a complete food, at least for adult dogs, but experience has shown us that excellent health is maintained when the above quantity of horse-flesh is added to the biscuits. It is also to be assumed that a proportion of the mutton greaves or "cracklings" is not digested by the dog, but at the same time it will serve a useful purpose by supplying bulk to the ration and to some extent take the place of the bones and more or less indigestible skin, some of which is, no doubt, consumed by the dog in its natural state. The albuminoid ratio of Dechambre's ration for the resting dog of 27 kilos is 1 to 6; that of this College, calculated from the chemical analysis, is 1 to 2·7 (the albuminoid ratio of bitch's milk is 1 to 2·2.

It is not suggested that either the ration of Dechambre or that in use here would be suitable for nursing bitches or growing pups. To make the diet complete, bones should be added and the best for this purpose are soft calf bones or the rib bones of lambs, which are easily masticated and digested. Rabbit, game, and poultry bones are to be avoided owing to their splintery nature and the frequency with which they cause serious intestinal lacerations. Though under more natural conditions, such as on farms, dogs possess the capacity to digest these splintery bones without apparently doing them any harm, house-dogs certainly have little power to do so. Some bulky food that is not so readily digested as flesh is an essential constituent of a maintenance ration for the dog, otherwise the excretion of waste products is delayed. Bones, furthermore, are very desirable in order to stiffen and harden the fæces and thus cause evacuation of the anal glands when the rectum is emptied.

In regard to the utilisation of *raw* flesh as part of the normal healthy dog's ration, this would not seem to be necessary. On the other hand, clinical experience has shown us that many cases of eczema in the dog are cured simply by making a complete change in the diet, withholding all carbonaceous food and giving raw flesh only. The potato above all foods seems to give the worst results, and in the opinion of many of us is responsible for a considerable amount of intestinal irritation and cutaneous lesions of an eczematous nature. Excessive feeding with porridge to house-dogs deprived of sufficient exercise also seems to be accountable for some of these troublesome conditions.

References.

1. The Nutrition of Farm Animals. H. P. Armsby. New York. 1917.
2. The Maintenance Requirements of Horses. R. G. Linton. Veterinary Journal, April, 1917.
3. Animal Nutrition. T. B. Wood. Cambridge. 1924.
4. Alimentation du chien par la methode des facteurs du rationnement. Recueil Med. Vet., xcv., Nos. 10 and 12, May and June, 1919, 220.

THE OXFORD OPHTHALMOLOGICAL CONGRESS.

The fifteenth annual meeting of the Oxford Ophthalmological Congress took place in the Department of Human Anatomy, Keble College, on July 3rd, 4th, and 5th, and during the greater part of the session was presided over by the Master, Sir Anderson Critchett.

Dr. E. Landolt (Paris) initiated a discussion on the

General Principles of the Treatment of Convergent Concomitant Strabismus.

He said that strabismus meant a vicious relative direction of the two eyes. To secure normal sight the visual lines of the two eyes should be directed simultaneously upon the point which at the moment the person was interested in; the accomplishment of this meant the use of binocular vision. It demanded, therefore, that the image of the object being looked at be formed at the same moment on both foveæ. When binocular vision was not operative in an individual, the cause might be a central one, but in most cases it was due to visual impairment of one of the eyes. The absence of binocular vision was the chief cause of the occurrence of concomitant strabismus. In concomitant strabismus the visual lines crossed either beyond or within the point fixed by one of the eyes. In the former event the squint was divergent (relative or absolute), in the latter it was convergent. When binocular vision was not in operation other influences played a part in determining the relative direction of the two eyes. The first important influence was the direction of the eyes in a state of absolute rest, which was a divergent direction; hence a divergent squint was a passive squint. The second influence was an excessive stimulus to convergence, and therefore this was an active squint, and it might be produced by some special alteration of the nerve centres. It was mostly due, however, to the relationship between convergence and accommodation, an unusual effort to accommodate calling forth excessive convergence. As convergence depended only on the distance of the fixed point, it was the same for all eyes; but accommodation depended also upon the refraction of the eyes. Eyes whose refraction was defective, especially those which were hypermetropic, had to provide a greater amount of accommodation than of convergence, and when binocular vision was not operative the convergence followed the impulse of the accommodation. One eye saw the object distinctly, and the excess of convergence was manifest only in the other eye.

With regard to treatment, the first aim should be to restore binocular vision. This could be done by correcting the optical errors, and particularly the errors of the deviating eye, and in the second place, by isolated visual exercises of this eye and orthoptic exercises of both eyes. Convergent squint required that the spasm of accommodation should be subdued, by such means as the use of mydriatics, the wearing of convex glasses, and giving the eyes rest. If orthoptic treatment failed, surgery would cure the squint—i.e., advancement of the external recti with resection of the extremity of the muscles. He did not advocate surgery to replace the other means, but to complete them.

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Having determined the maintenance requirements of an animal of any given weight, those for other animals of the same species but different weights may be calculated approximately by means of the well-known surface law of Rubner. Though not sufficiently accurate for experimental work, this method may be applied to every-day use provided that it is not interpreted too literally. A considerable margin for error must be allowed. Estimates of the weights of horses are often exaggerated. The writer found the weight of British army horses in good hard-working condition, not fat, to be as follows: Heavy draught mules 1350 lb., heavy draught horses 1300 lb., light draught horses 1150 lb., light draught mules 1100 lb., riders first class 1075 lb., and riders second class 975 lb. The average weight of heavy draught horses kept in a fatter condition than those in the army is 14 cwt. It is an exceptional animal that weighs over 16 cwt., though some approach a ton in weight.

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The allowance for an Airedale or collie, weighing approximately 27 kilos, was weighed and analysed. The dog biscuit weighed 380 g., and the fresh unboiled horse-flesh 170 g. The analysis of each was found to be as shown in Table I.

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—	Biscuit.	Horse-flesh.	Total in ration.
	Per cent.	Per cent.	Grammes.
Water	15·73	74·94	—
Fat	2·28	2·60	13
Albuminoids	16·62	21·00	99
Carbohydrates	62·89	—	239
Fibre	1·10	—	—
Ash	1·38	1·08	—
Not accounted for.. ..	—	0·38	—
	100·00	100·00	351

For the above analyses the writer is indebted to his colleague, Prof. G. H. Gemmell, F.I.C.

This ration, which the clinical department of this College has found by experience to be suitable for adult dogs weighing about 24 kilos and not getting more than sufficient exercise to keep them in good health, was fixed upon without reference to any former investigation undertaken to determine a satisfactory diet. It is, therefore, particularly interesting to compare it with the rations for dogs suggested by Dechambre.[4] Dechambre published the results of his investigations in 1919, and stated that he considers that maintenance requirements for the dog can be calculated according to the surface law, as is the case with other animals. He published a table setting out the maintenance rations for dogs from 5 to 100 kilos in weight and also gave rations suitable for dogs doing moderate and hard work. For a dog of 27 kilos, such as an Airedale or collie, he allows for maintenance: Protein 55 g., fat 15 g., and carbohydrate 300 g., giving a total of 388 nutritive units reckoned on the formula (total protein + total carbohydrate + total fat × 2·2). The compared rations in grammes, therefore, are as given in Table II.

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—	Protein.	Fat.	Carbohydrate.	Total nutritive units.
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A comparison of these two rations shows that there is a close similarity in the total nutritive units supplied, but the diet given in this College contains nearly twice as much protein as that recommended by Dechambre and considerably less carbohydrate. The total protein allowed by Dechambre for hard-working dogs of 27 kilos weight is 100 g. As the

380 g. of dog biscuit contains 63 g. of protein, it might be assumed that the biscuits by themselves would constitute a complete food, at least for adult dogs, but experience has shown us that excellent health is maintained when the above quantity of horse-flesh is added to the biscuits. It is also to be assumed that a proportion of the mutton greaves or "cracklings" is not digested by the dog, but at the same time it will serve a useful purpose by supplying bulk to the ration and to some extent take the place of the bones and more or less indigestible skin, some of which is, no doubt, consumed by the dog in its natural state. The albuminoid ratio of Dechambre's ration for the resting dog of 27 kilos is 1 to 6; that of this College, calculated from the chemical analysis, is 1 to 2·7 (the albuminoid ratio of bitch's milk is 1 to 2·2.

It is not suggested that either the ration of Dechambre or that in use here would be suitable for nursing bitches or growing pups. To make the diet complete, bones should be added and the best for this purpose are soft calf bones or the rib bones of lambs, which are easily masticated and digested. Rabbit, game, and poultry bones are to be avoided owing to their splintery nature and the frequency with which they cause serious intestinal lacerations. Though under more natural conditions, such as on farms, dogs possess the capacity to digest these splintery bones without apparently doing them any harm, house-dogs certainly have little power to do so. Some bulky food that is not so readily digested as flesh is an essential constituent of a maintenance ration for the dog, otherwise the excretion of waste products is delayed. Bones, furthermore, are very desirable in order to stiffen and harden the fæces and thus cause evacuation of the anal glands when the rectum is emptied.

In regard to the utilisation of *raw* flesh as part of the normal healthy dog's ration, this would not seem to be necessary. On the other hand, clinical experience has shown us that many cases of eczema in the dog are cured simply by making a complete change in the diet, withholding all carbonaceous food and giving raw flesh only. The potato above all foods seems to give the worst results, and in the opinion of many of us is responsible for a considerable amount of intestinal irritation and cutaneous lesions of an eczematous nature. Excessive feeding with porridge to house-dogs deprived of sufficient exercise also seems to be accountable for some of these troublesome conditions.

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were all seen by him, carefully examined, and kept under periodic examination; 40 per cent. of the children referred to him in this capacity had squint. His aim was to cure refractive errors, and either prevent or cure amblyopia and straighten the optic axes. A printed leaflet of instructions to parents and guardians was distributed, and it had been a considerable help in the work. If the eyes could be got straight he believed many of the cases would fuse well of themselves. He did not hesitate to operate where it was required, and he considered that advancement was by far the best operation. In some cases, those which squinted from a very early age, he considered there was an anatomical peculiarity which accounted for it.

Mr. Ernest Clarke reiterated his views on the subject, calling special attention to the possible ætiology and the necessity of quite early treatment.

Mr. Claude Worth expressed his entire agreement with all the contentions Dr. Landolt had advanced, and gratefully acknowledged his teaching in regard to advancement. Gradually he had himself given up tenotomy. He had never seen the external ocular muscle abnormally strong, but it might be much weaker than usual. He regarded the amblyopia accompanying squint as the most important subject of all. It was in most cases acquired. The occlusion treatment was useless unless it was thorough; and there must be no possible avenue for sight by the side of the bandage, or the effort would be valueless.

Mr. Angus MacGillivray (Dundee) said his own idea of the origin of the amblyopia of squint was, that one eye had not been educated, and he believed that an infant's eyes were blind eyes. In the course of his duties in connexion with recruiting at the time of the war he found a preponderant proportion of blind eyes and squinting eyes among the denizens of towns, and only a small number among those engaged in agricultural occupations.

Dr. Stewart Barrie and Dr. Marion Gilchrist (Glasgow) also spoke.

The Doyne Memorial Lecture was delivered by Mr. Harrison Butler, who spoke on Focal Illumination of the Eye, with special reference to the clinical use of the Gullstrand slit-lamp.

At the Saturday morning session the subject for discussion was

Ophthalmology from a Legal Aspect.

Mr. H. H. Joy, K.C., opened the debate, pointing out the present position of ophthalmic industrial diseases under the Workmen's Compensation Act. He drew attention to a very instructive case in this connexion. An excellent workman with two eyes had an accident to one, the sight of which had been lost some time before. No one but himself had known that only one eye was of use. The accident drew attention to the fact that he was a one-eyed man. He recovered from the injury to the useless eye and was, physically and industrially, as good a man as before. But, from the point of view of the Act, his ability to earn wages—really meaning the opportunity to earn adequate wages—was materially lessened, and he was turned down because he was a one-eyed man. The House of Lords reversed all the decisions of the Courts below, and said he was entitled to compensation because it was in consequence of the accident that he could not thereafter earn wages. Mr. Joy went in detail into the legal aspect of many points in the Act, and discussed the question from the same standpoint as to whether one attack of miner's nystagmus predisposed to a further attack, and whether, therefore, one attack lowered the man's industrial value. A number of opinions quoted showed an inclination to accept that view.

The questions raised were discussed by Mr. Harrison Butler, Dr. C. Harford, Dr. A. Greene, Mr. Bernard Cridland, Col. A. H. Tubby, Mr. R. Coulter, Dr. R. Jaques, Mr. G. H. Pooley, Dr. Park Lewis, Dr. A. S. Percival, Mr. MacGillivray, and Mr. T. L. Llewellyn.

Demonstrations.

During the meetings an adjoining room contained a very full museum of exhibits, and on Friday a number of demonstrations were given. Dr. George Young discussed recent observations on double sclerectomy by trephining without communication with the anterior chamber. Dr. Rayner D. Batten showed: (1) Ophthalmoscopic drawings with the epidiascope illustrating the value of collective drawings shown in cardio-vascular diseases, macular diseases, cerebro-macular disease, congenital diseases, and various unclassified diseases; (2) models of fundus conditions; (3) the hydrophthalmoscope; (4) orbital rigid spectacles with ptosis props; (5) fixation fork for the insertion of sutures in advancements; (6) tension experiments with balloons. Dr. Thomson Henderson showed: (1) sections illustrating various pathological conditions; (2) sections illustrating evolution of ciliary muscle in mammalia.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Medical Register and the Irish Free State.

THERE has been, as far as is known, no development in the situation as regards the Medical Register and the Irish Free State. Some weeks ago the Minister for Local Government heard a full statement from a deputation representing the several licensing bodies, and it was hoped that the Irish Government might without delay move in the direction suggested by Sir Donald MacAlister. Delay in the matter is dangerous. At any moment the Register may be closed to Irish diplomates, and it is much easier to continue an existing system than to arrange a new one. Moreover, to continue the old system temporarily commits neither country as to the future.

National Health Insurance Bill in Ireland.

When the State Government Grant to meet the expenses of medical certification for National Health Insurance purposes was stopped last year, it was necessary for the National Health Insurance Commission to apply funds from various sources towards the expenses of certification. For this purpose legislation was necessary, and the Bill effecting it has now passed through the Dail without much opposition. The present arrangement is purely temporary, and has only been accepted by the medical profession up to August 31st next.

The Medico-Psychological Association.

The Medico-Psychological Association of Great Britain and Ireland held its eighty-third annual meeting at Belfast, July 1st to 5th. About 60 members were present, all parts of the country being well represented. The Government Lunacy Department were represented by Dr. C. H. Bond (England), Sir Arthur Rose, D.S.O., and Dr. H. C. Marr (Scotland), Dr. D. L. Kelly (Irish Free State), Colonel W. R. Dawson and Dr. N. C. Patrick (Northern Ireland). Dr. E. Goodall, the President, took the chair at the preliminary meeting in the Queen's University, at which Sir Frederick Mott was chosen president-elect for the year 1925-26. The following were elected Hon. Members of the Association: Lord Sandhurst, Prof. McDougall (Harvard University), and Colonel Dawson (Chief Medical Officer, Ministry of Home Affairs, Northern Ireland). The following were elected Corresponding Members: Dr. H. Cotton (New Jersey State Hospital) and Prof. Winckler (Utrecht University). Dr. Shaw Bolton was nominated Maudsley Lecturer for 1925. Dr. F. R. Martin read a paper on the Reaction of the Blood to the Ingestion of Protein in the Psychoses, and Dr. Thomas Houston gave a demonstration on the Examination of the Spinal Fluid.

In the afternoon a civic reception to the Association was given in the City Hall by the Lord Mayor of Belfast, Sir W. G. Turner, and this was followed by a luncheon. On reassembling at the Queen's University, a vote of thanks was passed to the officers and council of the Association, and the incoming President, Dr. M. J. Nolan, took the chair. In his inaugural address he dealt with the various schools of thought in psychological medicine; all of which had their contribution to make to practice. These were, he said, elements of truth and value in the different schools; the individual must be studied, and clinical experience must be the chief guide. He emphasised the importance of preventive measures and of early treatment in mental disorders. At the conclusion of the President's address the members inspected the Purdysburn Villa Colony (Belfast Mental Hospital). In the evening a reception was held in the Queen's University, when the guests were received by the Vice-Chancellor, Mr. R. W. Livingstone, M.A., and Mrs. Livingstone.

On Thursday morning, July 3rd, a paper was read by Sir Frederick Mott on the Thyroid Gland in Bodily and Mental Diseases. The comparative iodine content was estimated in 100 thyroid glands obtained from patients dying in general hospitals, in hospitals for consumption, and in asylums. There were no histological changes which could be associated with any particular form of mental disease, nor could one predict the iodine content in these cases. In cases of sudden death, or rapid death from disease, the iodine content was high. It was low on the average in tuberculosis and in chronic dysentery. It was lower than the average in the psychoses and in general paralysis. As nearly all the mental cases died from some chronic bodily disease it was difficult to dissociate the effects of this morbid condition from the effect which the mental state may have had. Attention was called to the thyroid gland being one of the important defences of the body against disease caused by chronic infections using up the thyro-iodine and thus impairing the oxidation processes required for metabolism. Chronic infections might excite or prolong mental disorder in a potentially unstable brain. A paper on Encephalitis Lethargica was then read by Dr. R. Marshall (Belfast), in which the experience gained in Belfast in the last two epidemics was summed up.

The members were entertained to luncheon by the invitation of the Ministry of Home Affairs, Northern Ireland, and in the afternoon an address was given by Dr. Chalmers Watson on Further Reflections on the Rôle of Auto-infection in the Ætiology of Acute and Chronic Mental Disorders. In the evening the annual dinner was held in the Grand Hall of the University, at which about 90 members and guests were present.

On Friday, July 4th, a visit was paid to the County Down Asylum at Downpatrick. Prof. G. M. Robertson read a paper on Is Dementia Præcox a Clinical Entity? in which he discussed the views of Kraepelin and others, but refrained from any dogmatic conclusion. Colonel Dawson read a paper on the Belfast War Hospital and its Work, 1917-19. The asylum was subsequently inspected. After return to town a lecture was given by Prof. T. Walmsley on the Psychology of Primitive Man.

Saturday, July 5th, was devoted to an excursion to the Mourne Mountain District, co. Down.

Report of Inspector of Lunatics, Northern Ireland.

The first report of the Inspector of Lunatics, Northern Ireland, recently published,[1] but covering the years 1921-22, contains the usual statistics and brief records of the state of the asylums in question. There are 4277 insane in six institutions, of which Belfast and Down have up-to-date and well-equipped buildings, whereas the remainder suffer certain structural and other disadvantages. At Armagh there is overcrowding, and adverse comment is made on the dietary, some of the furniture, and the absence of an observation ward. Antrim is also somewhat overfull; the building is in good order, but no regular training is afforded to the attendants and nurses. Londonderry suffers from the antiquated and unsatisfactory nature of the old buildings, and needs an additional medical officer. At Omagh a new water-supply is being sought. There are no references in this report to the general health of the patients in these asylums, or the incidence of such diseases as dysentery, typhoid, and tuberculosis. The conditions here disclosed are characterised by a considerable degree of order, efficiency, and comfort for the patients. The price of this report, consisting of 47 pages only, is 7*s*.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Annual Session of the American Medical Association.

THE seventy-fifth session was held this year in Chicago from June 10th to 13th. There was a record attendance, and the meeting was generally considered to have been a very successful one. The famous Municipal Pier, a huge structure which stretches for nearly a mile into Lake Michigan, provided ample accommodation for the activities of the Association. At the shore end were the offices for registration, information bureau, &c., and beyond this nearly a quarter of a mile devoted to scientific and commercial exhibits from various schools and firms. Beyond this again were large spaces divided off for sectional meetings. On June 9th and 10th diagnostic clinics were held by well-known medical men from all over the country. On the evening of June 10th the opening meeting was held, Dr. Ray Lyman Wilbur, of Stanford University, California, last year's President, being in the chair. The new President, Dr. William A. Pusey, of Chicago, delivered his address on "Some of the Social Problems of Medicine." Dr. Pusey spoke of the tendency of the modern world towards socialisation, and said that the medical profession must form part of the intellectual minority which will check the excesses of this tendency and guide it in the direction of moderation and wisdom. Amongst the distinguished foreign guests present at the Association meeting were: Miss Louisa Martindale, of London; Dr. Leonard Findlay, of Glasgow; Dr. Wills Maclachlan, of Toronto; Prof. Finkelstein, of Berlin; Prof. Petrén, of Lund, Sweden; and Prof. Sendjiak, of Warsaw, Poland. The sectional discussions were too various to enumerate. Among the many interesting addresses was one with demonstrations by Dr. George Dick, of Chicago, on his test for scarlet fever immunity. A feature was a motion-picture theatre at which many topical demonstrations were given.

Of the many ingenious novelties shown at the exhibition perhaps the most remarkable was one by C. T. Gamble, Philadelphia, and Richard Cabot, Boston. This was an electric amplifier stethoscope provided with electrical filters by means of which many scores of people could listen at one time to the same heart or chest, the sounds of which could be amplified more or less as desired. Phonographic records of heart sounds were also exhibited. This device seems to offer great possibilities in the teaching of auscultation, aside from its value as a diagnostic aid.

On the evening of Monday, June 9th, a complimentary dinner was given to Dr. G. H. Simmons on his twenty-fifth anniversary as Editor of the *Journal of the American Medical Association*. Dr. Harvey Cushing was in the chair, and the others who spoke in appreciation of Dr. Simmons's work were: Dr. Frank Billings, Dr. William Mayo, Dr. William D. Jones, Dr. Hubert Work, and Dr. William S. Thayer, the last of whom made the presentation of a portrait by Arvid Nyholm.

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[1] H.M. Stationery Office, 15, Donegall-square W., Belfast. 7s.

The Work of the A.M.A.—Chicago is the home of the Association. "From a corner in the office of Dr. N. S. Davis, of Chicago, to a six-story plant occupying 100 by 160 feet, and providing ample accommodations for at least the present needs; from a yearly volume of transactions to a weekly publication averaging 144 pages, and a circulation of more than 80,000, with journals for seven medical specialties of importance, a lay journal, and bureaus for all the interests of the physicians—this, in a brief statement, has been the progress of the American Medical Association." Thus runs the first sentence in a booklet published by the Association, describing its work. The organisation represents 90,000 of the 145,000 physicians of the country, and almost 60,000 of them, as Fellows of the Association, take an active interest in its work. The publications edited and printed by the American Medical Association include the *Journal of the American Medical Association*, its Spanish edition, the *American Journal of Diseases of Children*, the *Archives of Internal Medicine*, the *Archives of Surgery*, the *Archives of Neurology and Psychiatry*, the *Archives of Dermatology and Syphilology*, the American Medical Association *Bulletin* and *Hygeia*. The latter is published under the auspices of the Bureau of Health and Public Instruction, the function of which is "to promote in various ways the education of the public along health and medical lines."

One of the most interesting of the departments is that of the Bureau of Investigation directed by Dr. Arthur J. Cramp, which conducts an unceasing campaign against quackery of all sorts. Information of every description, advertisements, pamphlets, &c., used by patent-medicine makers is gathered and filed. Small pamphlets written for the laity are published under therapeutic groups such as "cancer cures," "deafness cures," and "female weakness cures." Any layman making inquiry concerning some quack medicine is furnished with the appropriate pamphlet. "Nostrums and Quackery" is an interesting two-volume compilation of facts about a vast number of patent medicines, and loose-leaf pages of it are sent out to laymen and physicians in answer to letters of inquiry. Many newspapers and magazine editors consult the department concerning the genuineness of solicited advertisements. The information is obtained by original investigations made by the department supplemented by data received from any reputable source outside, including foreign sources such as the report of the Select Committee on Patent Medicines of Great Britain, and the Royal Commission on Secret Drugs, Cures, and Foods of Australia. The whole organisation is a good example of successful centralisation.

Mental Disorder in Immigrants.

A question of greater importance in the United States than elsewhere, but none the less of general interest, is ventilated in a recent issue (Vol. xxxix., No. 17) of the *Public Health Reports of the United States Government*, by Miss M. C. Jarrett. It has been asserted that difficulty of adaptation to new surroundings is a cause of mental disorder in immigrants. From a study of 240 boys of foreign parentage, Miss Jarrett can find no grounds for the belief that the complexity and unfamiliarity of American customs and institutions often cause immigrants to become mentally unbalanced or harassed to the point of committing anti-social acts. The influence of social factors peculiar to immigrants could not be identified as responsible for delinquency or other mental abnormality in any of these cases. The findings are negative, bearing in no way on the general question of mental health in the United States, which is at present receiving much attention. The amount of painstaking social work being carried on may be gathered from the fact that each of the families of some of these cases had been cared for by no less than seven, eight, and in one case 15, different "social agencies."

Public Health Services.

THE HEALTH OF LONDON IN 1923.

Sir William Hamer, medical officer of health and school medical officer to the London County Council, reports that the year 1923 was remarkable for the lowest death-rate and lowest infant mortality-rate ever recorded in London. The Registrar-General estimates the civil population at 4,564,109, and the non-civilian at 6000. The birth-rate was 20·1, the death-rate 11·4, and the infant mortality-rate 61. The death-rates from tuberculosis and cancer were 1·2 and 1·4 respectively. Sir William Hamer discusses the London life-tables since 1841, and shows that in the course of 80 years the Londoner's expectation of life has been extended from 34·6 years to 53·8 years for males, and from 38·3 years to 59·1 years for females. The number of legitimate children born per hundred married women of ages 15 to 45 years has decreased by 29·7 per cent. during this period, and only about 3·2 per cent. of this change is due to the altered age constitution of the married women of child-bearing age.

The year 1923 marks another successful period in dealing with the prevention of *small-pox* in London, only 11 cases with one death having occurred during the year. The wonderful success of this branch of the public health administration is attributed to the close coöperation of the Ministry of Health, the County Council, the Metropolitan Asylums Board, the City Corporation, the Port Authority, the borough councils, and the boards of guardians and sanitary authorities in the area of Greater London. Examples are given of the care taken to search out contacts who may have been infected, and one illustrative case is given of a patient who went about as usual for 24 days after she became infectious before the nature of her case was recognised. The valuable assistance of the Council's experts in diagnosis, Dr. W. McC. Wanklyn and Dr. J. A. H. Brincker, receives due recognition. The notifications of tuberculosis during 1923 were slightly more than twice the deaths in number.

Sir William Hamer discusses the views expressed by Dr. Dublin, the statistician of the Metropolitan Life Insurance Company of New York, as to the influence of *environment* and *heredity* respectively. Dr. Dublin thinks that on the score of geographical variation, the environmentalists have the better of the argument. The sex and age variations also favour the environmentalists, as there is no evidence of a differential heredity endowment among brothers and sisters. Tuberculosis is said to be less fatal among Jews and Italians, but the rates among Jews and Italians respectively vary according to their environment. For an explanation of variation according to economic levels, the eugenists have to rest their case on the superior endowments and vigour of the groups who make up the well-to-do classes of the community as distinguished from the poor. As regards the effect of occupation, the eugenists would need to hold that the persons engaged in various occupations are selected in accordance with their inherited ability to withstand tuberculosis. Finally, Dr. Dublin states that the eugenists lose no opportunity of saying that there has been no improvement in the racial constitution of the people of the U.S.A., but rather a deterioration, and in spite of this the tuberculosis death-rate has fallen by 50 per cent. during the last 20 years. There is good evidence that the population of America is better off. Never before in the history of the country has so favourable a change come over the environment of the people as in the years subsequent to the late war. Sir William Hamer appears to favour his final conclusion that the environmentalists have the best of the argument all through.

The report deals at length with the behaviour of *influenza*, together with the group of diseases which Sir William Hamer associates with it—namely, cerebro-spinal fever, poliomyelitis, and polio-encephalitis and encephalitis lethargica. He suggests that influenza is primarily a disease of the cerebro-spinal nervous system, and that this in part accounts for its protean manifestations, another reason being the lesser stability of the *materies morbi* as compared with organisms like the tubercle bacillus. Major waves of influenza develop about every 15 or 20 years as great pandemic prevalences, and preceding and following each pandemic at intervals of some one, two, or three years come the trailer epidemics. While pandemic influenza especially attacks persons of young adult or adult age, the trailer outbreaks seem to affect rather the young children or old persons who have escaped attack during the pandemic. Sir William Hamer endeavours to account for the disparity between the simple measles curve and the complex influenza curve.

The theory that much of the *typhoid fever* in London has been due to the consumption of immature plaice from the area including the mouth of the Elbe is further discussed, and, in fact, extended to other parts of England, as Sir William Hamer shows that the Humber ports were at one time the source of supply of this class of fish.

The *death-rate from cancer* in London is shown to be slightly higher than that for England and Wales as a whole. During the last 70 years the mortality among males has increased five-fold, while that among females less than two and a half times. The ratio of the male to the female rate, which in 1850–52 was 100 to 195, is now 100 to 83.

During the spring of 1923 publicity was given to a *skin disease caused by wearing furs.* A sample of one of the furs indicated was examined in the Council's laboratory. The furs in question are known as "coney-beaver," and the varieties mainly indicated were those of the lighter shades. The chemical substance which poisons the skin disappears in course of time by volatilisation. The Ministry of Health conferred with the London Fur Traders' Association with regard to the matter, and it is assumed that the measures taken to prevent an occurrence of the mischief have been effective.

In discussing the *venereal diseases schemes,* Sir William Hamer shows that the ratio of attendances to venereal cases is 29 to each new case, a higher ratio than obtains even in those countries where venereal diseases are compulsorily notifiable. The records show that medical practitioners made more use of the facilities for pathological examinations in 1923 than ever before. Sir William Hamer states that most of the suggestions contained in the report of the Trevethin committee have already been embodied in the Council's scheme.

During 1923 Dr. N. D. Bardswell investigated the *after-histories of adult tuberculous persons* in the County of London who received institutional treatment during the year 1918, and his inquiry confirms the usefulness of the sanatorium in the treatment of tuberculosis in its initial stages and its ineffectiveness when the disease is well established. The question is asked: What more can be done to improve the prospects of the moderately advanced case and is a mortality of some 70 per cent. within four years to be accepted as inevitable? The chances of the civilian and the ex-Service man are compared. The ex-Service man has no limit put to his institutional treatment; it may be repeated and prolonged. He is free from financial worries and anxieties about dependents. He has a well-endowed scheme of after-care. One is not surprised to learn, therefore, from the table given that the results of treating ex-Service men are materially better than those of treating comparable cases among the rest of the population.

The death-rate from *puerperal sepsis* per 1000 births was 1·1, about the same as that for England and Wales during the two previous years. The death-rate for other child-birth causes is not given. Nine hundred and five midwives gave notice of their intention to practise within the county, an increase of 76 on last year's figures. Their work is supervised by four women medical inspectors. Midwives attended about 12,000 confinements and sent for medical aid in 17 per cent. of the cases. The births attended by the midwives numbered 45 per cent. of the total births. They were debited with about 30 per cent. of the fatal cases of puerperal fever, and about 60 per cent. of the notified cases of *ophthalmia neonatorum.* Of the 753 cases of this latter disease, 449 occurred in the practice of midwives, of which 420 cases made a complete recovery and there were 12 deaths. The damage done to survivors was as follows: one case of blindness in both eyes, one case of blindness of one eye, two cases of impairment of vision in both, and one of impairment in one eye. In 11 instances the result was not ascertained owing to removal. In addition, two unnotified cases were investigated, one resulting in total blindness and the other in the loss of sight of one eye. Sixty-four cases received in-patient hospital treatment at St. Margaret's Hospital. No information is given as to the damage done to eyesight in the 304 notified cases which did not occur in the practice of midwives. It seems to be of the highest importance on every ground that we should know the complete story from every district in the county with respect to this tragedy of child life.

MENTAL HOSPITALS SERVICE.

Scottish Western Asylums Research Institute.

THE fourteenth annual report of this institute illustrates the results which may be obtained when a group of institutions combine to have their pathological work carried out by a single efficient laboratory, —an arrangement of which there appears to be only one example in England. This example might well be followed by other mental hospitals in which the establishment of individual laboratories is impracticable. Some 2500 investigations have been carried out during the year. Research has been somewhat interrupted by the immense volume of tedious work involved in detecting a number of intermittent typhoid carriers. Dr. W. Whitelaw, the director, discusses the problem of dealing with these carriers after their detection; there is no infallible means of eradicating the infection from these patients, and he very reasonably suggests that all of them throughout Scotland should be gathered together in one institution. "Administration would be easier; isolation would be more efficient; the isolation would be less burdensome to the patients." Among the subjects of original work pursued during the year have been blood-sugar variations in emotional states, calcium metabolism, and the *Bacillus acidophilus* milk treatment. In discussing the treatment of general paralysis, Dr. Whitelaw suggests that if recent methods are to be tested adequately each will have to be applied on as large a scale as possible (as by confining the treatment of this disease in each of several institutions to a single specific method), and the results of this large-scale adoption compared.

Glasgow Royal Asylum.

Several new developments are recorded or foreshadowed in the annual report for 1923. The hospital now has a complete consulting staff of eight members in addition to the resident staff of four medical officers for about 500 patients—five names occur in the list of officers, but both the late second assistant medical officer and his successor are included. Miss Dorothea Robertson has been appointed as "occupational teacher." An "occupational pavilion" has been built, and the results attained already by the systematic teaching of handicrafts to patients who previously "sat listless about the wards" are stated to be excellent. Several recoveries are attributed to the treatment; the wards are quieter, and the general life of the hospital has greatly benefited. The medical superintendent, Dr. D. K. Henderson, discusses at some length the difficulty of finding suitable candidates for the nursing staff. In appealing for "a well-educated, intelligent, and refined type of girl," he points out the advantages of a mental hospital career and the real interest of the work. A new nurses' home is to be built, and it is hoped that its amenities will offer a further inducement to the entry of nurses.

Cumberland and Westmorland Mental Hospital.

In the annual report for 1923 it is recorded that a dental surgeon has been appointed, a step previously recommended by the visiting Commissioners on several occasions. A low recovery-rate, and the small proportion of patients usefully employed, are explained by the admission of many senile and other hopeless cases. "The character of the majority of cases admitted during the last few years shows a marked deterioration." The Commissioner's report suggests extending the practice of giving money allowances to patients on trial, and granting leave on trial to larger numbers. Dr. W. F. Farquharson, the medical superintendent, observes that changes in the female nursing and domestic staff continue to be unduly numerous.

City of Leicester Mental Hospital.

An increase in the number of female patients, and in the ratio of the insane to the general population of Leicester, is recorded in the annual report for 1923. There are now 542 patients, and the hospital is staffed by three medical officers. A visiting dentist has recently been appointed, and appears to have carried out a large amount of work, and an X ray apparatus has been installed. This hospital has three classes of parole—42 patients are allowed outside the hospital unattended, 117 in the grounds, and 147 are allowed to move about the wards and in the ward gardens. In addition 78 are allowed to visit their homes for week-ends. This appears to be a remarkable example of what can be done in allowing freedom to patients when close attention is paid to the possibilities and limitations of each individual case. Dr. J. F. Dixon notes that four escapes (so-called) occurred during the year, all of cases on parole or limited parole, who may more correctly be said to have absented themselves without leave.

Middlesbrough Borough Mental Hospital.

The visiting Commissioner's observations, reprinted in the annual report for 1923, suggest the provision of a more ample stock of clothing and tooth-brushes, greater variety in the diet, and the appointment of a dentist. Outside parole has been allowed to 15 patients, and it is suggested that open doors and limited parole in the grounds might be of similar benefit to a larger number. The hospital contains about 430 patients, and is staffed by two medical officers. The medical superintendent, Dr. J. W. Geddes, states that 58 per cent. of the patients were kept usefully employed, and that the recovery-rate was 41·7 per cent. on the direct admissions.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 5TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 62; scarlet fever, 1267; diphtheria, 619 (as against 692 of the previous week); enteric fever, 138 (as against 181 of the previous week); pneumonia, 657; puerperal fever, 36; cerebro-spinal fever, 10; acute poliomyelitis, 12; encephalitis lethargica, 103 (as against 132 of the previous week); continued fever, 1; dysentery, 6; ophthalmia neonatorum, 132. There were no cases of cholera, plague, acute polio-encephalitis, or typhus fever notified during the week. Of the 62 cases of small-pox, 1 was notified from the County of London (Kensington); 20 from the county of Derby (Derby 7, Chesterfield 11, Chesterfield R.D. 1); 1 from the county of Middlesex (Willesden); 7 from Northumberland (Ashington); 13 from the county of Nottingham (Hucknall 7, Kirkby in Ashfield 3); 4 from the county of Warwick (Coventry); 5 from Yorks, North Riding (Middlesbrough); 6 from Yorks, West Riding (Rotherham 5). Of the cases of encephalitis lethargica, 14 were notified from the County of London (Bermondsey 2, Camberwell 2, Fulham 1, Kensington 1, Paddington 1, St. Marylebone 1, St. Pancras 2, Southwark 1, Stepney 1, Wandsworth 1); 5 from the county of Durham (Sunderland 2); 5 from Bristol; 18 from the county of Lancaster (Liverpool 3, Manchester 8); 3 from Northumberland (Newcastle 2); 4 from the county of Stafford (Burton-upon-Trent 2); 8 from the county of Warwick (Birmingham 5); and 14 from Yorks, West Riding (Sheffield 7).

Deaths.—In the aggregate of great towns, the deaths from influenza fell from 30 (of the previous week) to 21, while deaths from measles fell from 57 (of the previous week) to 36.

Obituary.

SIR SYDNEY RUSSELL-WELLS, M.D., B.Sc., F.R.C.P. LOND., M.P.

WE greatly regret to announce the death on July 14th of Sir Sydney Russell-Wells, Member of Parliament since 1922 for the University of London. Death came with tragic suddenness, for he had been engaged an hour before in his professional duties.

Sydney Russell-Wells was born in London on Sept. 25th, 1869, the son of Benjamin Weston Wells. He was educated privately, his bent for science being early apparent and his first serious study being devoted to chemistry at the Royal College of Science; in 1889 he took his B.Sc. degree at London University from University College, becoming about the same time a Fellow of the Chemical Society. Turning to medicine, Russell-Wells then entered St. George's Hospital, obtaining in succession the Pollock, Treasurer's, and Brackenbury prizes, as well as the coveted William Brown exhibition of £100 tenable for two years. After qualifying M.B. Lond. in 1893, with honours in two subjects, he took a series of house appointments at St. George's, becoming medical registrar, and would no doubt have taken a position there on the honorary staff had not his educational interests already broadened to include much outside the range of clinical medicine. As it was, he became physician to the Seamen's Hospital at Greenwich and to the National Hospital for Diseases of the Heart, Westmoreland-street, as well as lecturer in the London School of Clinical Medicine. In all these capacities his love of detail and lavish expenditure of time were put freely at the use of the post-graduate students from all parts of the world who attended his demonstrations; his clinical directions to patients were those of the practical man and chemist, and many learned to appreciate the adviser who bade them shun the butcher and cherish the baker and greengrocer. His cardiac work included study with Leonard Hill of the influence of resilience of the arterial wall on blood pressure and an elaborate investigation into the cardiac efficiency of 10,000 recruits with alleged circulatory disturbances. A remarkably complete account of a case of intermittent complete heart-block appeared in our columns two years ago.

In the University of London Russell-Wells's interest was lifelong: the University was his hobby, his constant pre-occupation. He stood always as the champion of the external student, and although he came to realise that the degree of medicine differed from that in other faculties mainly because the course of education as well as the examinational results had to be standardised, he was always opposed to any narrow collegiate conception of University life. He saw the need of a faculty of commerce within the University, and having seen it spent years in working out the course of training and wearing down the difficulties urged against it. For long years a senator, with maximal attendances always recorded against his name, Russell-Wells finally obtained the desire of his heart, and from 1919–22, four critical years in its history, presided over the destinies of the University as its Vice-Chancellor. He represented the University on the General Medical Council and on the retirement of Sir Philip Magnus in 1922 succeeded him as representative in the House of Commons. In the House his voice was not often heard apart from his useful contributions in committee to academic and University affairs, but he was pledged to obtain, if possible, substantial modifications in the panel system, and he was strenuously opposed to any attempt to place the insurance medical service under the domination of the approved societies.

Sir Sydney Russell-Wells's services to education were recognised in 1921 by the conferment of a knighthood. He married in 1895 Harriett, third daughter of the late Stephen Smith, who, with one son and two daughters, survives him. Our sympathy goes out to them in their sudden bereavement.

Correspondence.

"Audi alteram partem."

MEDICAL EDUCATION: PROPOSED CHANGES.

To the Editor of THE LANCET.

SIR,—A very important movement in connexion with medical education is at present under the consideration of the Senate of the University of London, which, as it must affect clinical as well as intermediate teaching, should not be allowed to pass without the opinions of the teachers of the final subjects being ascertained.

The movement began, we believe, by University College asking to be allowed to hold a special intermediate examination in anatomy, physiology, organic chemistry, and pharmacology for its own students. Apparently the greater number of London teachers in the latter three subjects favour this course, on condition that each teacher shall hold an independent examination, supervised by an external examiner, at his own school, but that there shall be a common paper set by all the teachers as well as by the external examiner or examiners. Doubtless the ideal which these teachers have in their minds is that they will have greater freedom to develop their teaching on their own lines, and will not necessarily be forced to cover the whole range of their subjects with equal care.

The greater number of the teachers of anatomy, on the other hand, while they sympathise with their colleagues' ideals and are willing to support them as far as physiology, organic chemistry, and pharmacology are concerned, have grave doubts whether the system can be applied to anatomy as taught to medical students. Every one of them would prefer, in his own interest, to teach those parts of anatomy which appeal to him most, and, of course, if he did so the examination must be so arranged that his students did not suffer for their lack of knowledge in those parts which he regarded as of secondary importance. They are doubtful, however, if this method, even with a common paper, would best prepare the medical student for his later clinical teaching.

The close association of the surgical and anatomical teachers, which is so much valued by the latter, impresses on them the necessity of giving an even, practical knowledge of the whole human body to their students, as far as the limited time at their disposal allows. A surgeon never knows what anatomical knowledge may not be useful to him, and the same thing may be said, though perhaps in a lesser degree, of the physician and the specialist. It is for this reason that they hope that the question may be regarded as one of sufficient importance to be considered carefully by the Advanced Medical Board, or, better still, by the whole Faculty of Medicine, and that the Senate will not make any sweeping alterations in our methods of teaching and examining in anatomy until the opinion of the whole faculty has been obtained.

The ideals of University College are these which the American universities have already attained. The ideal position of a professor who is free to devote himself to research in his own particular branch and can teach the things which interest him most can be fully appreciated. Has this method, as far as the average student is concerned, produced the best results from a clinical point of view? This is the point upon which our clinical colleagues, who have worked with American physicians and surgeons during the war, can give an opinion. Personally, we hold the London M.B. qualification in great respect and regard it as one of the best triple qualifications in the world. We are quite prepared to advance along the path of progress should we be convinced that a change in our methods is in the best interests of medical education.

We are, Sir, yours faithfully,

F. G. PARSONS,
J. ERNEST FRAZER,
E. BARCLAY-SMITH.

July 10th, 1924.

LEAD POISONING AND CANCER.

To the Editor of THE LANCET.

SIR,—It appears that my attempt—to which you referred in a leading article on June 7th—to secure assistance from statisticians and medical officers of health concerning a *possible* relationship between lead poisoning and immunity to cancer is unlikely to bear fruit in the immediate future for the following reasons:—

First, those who have already expressed their views in print—for example, Prof. E. L. Collis (THE LANCET, June 14th, p. 1239) and Mr. A. Feil (*La Presse Médicale*, June 28th, 1924, p. 1093)—have shown that they do not realise the difficulties of the subject from a statistical point of view. Both Prof. Collis and Mr. Feil take the comparative mortality figures of certain occupations in which lead poisoning may occur, and they assert that these show no evidence of any relationship, such as I have suggested may be possible.

I cannot here discuss all the relevant occupational statistics, so I shall refer only to those of one trade mentioned by them, and also discussed in my address (*Public Health*, June, 1924, p. 217)—namely, that of potters. How, I ask, is it possible to take the cancer mortality figures of all the members of this trade as indicative of the absence of the influence of lead on cancer, when only about 7 per cent. of the workers are exposed to the possibility of lead poisoning, and when to-day only a very small percentage of this 7 per cent. is poisoned with lead? In my address I stated that about 80 per cent. of potters are not exposed to the possibility of lead poisoning, but the more recent publication of Dr. F. Shufflebotham (THE LANCET, July 5th, p. 52) shows that the number is about 93 per cent.!

As I have stated, I do not think it is possible to use with statistical accuracy the present occupational comparative mortality-rates for the purpose I have in view. Nevertheless, to utilise them, as I did, to demonstrate a relationship between deaths from plumbism and deaths from cancer in the particular trades in which lead poisoning is most common, is justifiable as a preliminary procedure, provided the decennial increase is taken into account, and the age-periods between 25 and 65 years alone are considered. In regard to the last condition, it may be stated that the death-rate from cancer is greater after the age of 70 years in the ratio of more than 2 to 1—that is, after a majority of persons have ceased to work. In a table, which I repeat here, I show that in the only trade in which fatal lead poisoning increased during the decennial period considered the cancer death-rate decreased; and that in the two other trades a decrease in the number of deaths from plumbism was accompanied by an increase, above the normal, of deaths from cancer.

Comparative Mortality-rate per 100.000 Population at Ages 25–65 Years.

—		1900–1902.	1910–1912.	Percentage increase or decrease.
All males ..	Cancer ..	68	78	+15
	Plumbism .	1	1	0
File makers..	Cancer ..	57	78	+37
	Plumbism .	56	10	−82
Lead manufacture ..	Cancer ..	81	80	−1
	Plumbism .	102	123	+21
Plumbers, painters, and glaziers ..	Cancer ..	73	87	+19
	Plumbism .	23	20	−13

I do not assume statistical accuracy for these figures, but at least they are suggestive.

Secondly, the following conditions for statistical investigations must be observed: (*a*) Inevitability of lead poisoning; (*b*) existence of lead poisoning; (*c*) coexistence of one of these conditions with the

Cumberland and Westmorland Mental Hospital.

In the annual report for 1923 it is recorded that a dental surgeon has been appointed, a step previously recommended by the visiting Commissioners on several occasions. A low recovery-rate, and the small proportion of patients usefully employed, are explained by the admission of many senile and other hopeless cases. "The character of the majority of cases admitted during the last few years shows a marked deterioration." The Commissioner's report suggests extending the practice of giving money allowances to patients on trial, and granting leave on trial to larger numbers. Dr. W. F. Farquharson, the medical superintendent, observes that changes in the female nursing and domestic staff continue to be unduly numerous.

City of Leicester Mental Hospital.

An increase in the number of female patients, and in the ratio of the insane to the general population of Leicester, is recorded in the annual report for 1923. There are now 542 patients, and the hospital is staffed by three medical officers. A visiting dentist has recently been appointed, and appears to have carried out a large amount of work, and an X ray apparatus has been installed. This hospital has three classes of parole—42 patients are allowed outside the hospital unattended, 117 in the grounds, and 147 are allowed to move about the wards and in the ward gardens. In addition 78 are allowed to visit their homes for week-ends. This appears to be a remarkable example of what can be done in allowing freedom to patients when close attention is paid to the possibilities and limitations of each individual case. Dr. J. F. Dixon notes that four escapes (so-called) occurred during the year, all of cases on parole or limited parole, who may more correctly be said to have absented themselves without leave.

Middlesbrough Borough Mental Hospital.

The visiting Commissioner's observations, reprinted in the annual report for 1923, suggest the provision of a more ample stock of clothing and tooth-brushes, greater variety in the diet, and the appointment of a dentist. Outside parole has been allowed to 15 patients, and it is suggested that open doors and limited parole in the grounds might be of similar benefit to a larger number. The hospital contains about 430 patients, and is staffed by two medical officers. The medical superintendent, Dr. J. W. Geddes, states that 58 per cent. of the patients were kept usefully employed, and that the recovery-rate was 41·7 per cent. on the direct admissions.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 5TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 62; scarlet fever, 1267; diphtheria, 619 (as against 692 of the previous week); enteric fever, 138 (as against 181 of the previous week); pneumonia, 657; puerperal fever, 36; cerebro-spinal fever, 10; acute poliomyelitis, 12; encephalitis lethargica, 103 (as against 132 of the previous week); continued fever, 1; dysentery, 6; ophthalmia neonatorum, 132. There were no cases of cholera, plague, acute polio-encephalitis, or typhus fever notified during the week. Of the 62 cases of small-pox, 1 was notified from the County of London (Kensington); 20 from the county of Derby (Derby 7, Chesterfield 11, Chesterfield R.D. 1); 1 from the county of Middlesex (Willesden); 7 from Northumberland (Ashington); 13 from the county of Nottingham (Hucknall 7, Kirkby in Ashfield 3); 4 from the county of Warwick (Coventry); 5 from Yorks, North Riding (Middlesbrough); 6 from Yorks, West Riding (Rotherham 5). Of the cases of encephalitis lethargica, 14 were notified from the County of London (Bermondsey 2, Camberwell 2, Fulham 1, Kensington 1, Paddington 1, St. Marylebone 1, St. Pancras 2, Southwark 1, Stepney 1, Wandsworth 1); 5 from the county of Durham (Sunderland 2); 5 from Bristol; 18 from the county of Lancaster (Liverpool 3, Manchester 8); 3 from Northumberland (Newcastle 2); 4 from the county of Stafford (Burton-upon-Trent 2); 8 from the county of Warwick (Birmingham 5); and 14 from Yorks, West Riding (Sheffield 7).

Deaths.—In the aggregate of great towns, the deaths from influenza fell from 30 (of the previous week) to 21, while deaths from measles fell from 57 (of the previous week) to 36.

Obituary.

SIR SYDNEY RUSSELL-WELLS, M.D., B.Sc., F.R.C.P. LOND., M.P.

WE greatly regret to announce the death on July 14th of Sir Sydney Russell-Wells, Member of Parliament since 1922 for the University of London. Death came with tragic suddenness, for he had been engaged an hour before in his professional duties.

Sydney Russell-Wells was born in London on Sept. 25th, 1869, the son of Benjamin Weston Wells. He was educated privately, his bent for science being early apparent and his first serious study being devoted to chemistry at the Royal College of Science; in 1889 he took his B.Sc. degree at London University from University College, becoming about the same time a Fellow of the Chemical Society. Turning to medicine, Russell-Wells then entered St. George's Hospital, obtaining in succession the Pollock, Treasurer's, and Brackenbury prizes, as well as the coveted William Brown exhibition of £100 tenable for two years. After qualifying M.B. Lond. in 1893, with honours in two subjects, he took a series of house appointments at St. George's, becoming medical registrar, and would no doubt have taken a position there on the honorary staff had not his educational interests already broadened to include much outside the range of clinical medicine. As it was, he became physician to the Seamen's Hospital at Greenwich and to the National Hospital for Diseases of the Heart, Westmoreland-street, as well as lecturer in the London School of Clinical Medicine. In all these capacities his love of detail and lavish expenditure of time were put freely at the use of the post-graduate students from all parts of the world who attended his demonstrations; his clinical directions to patients were those of the practical man and chemist, and many learned to appreciate the adviser who bade them shun the butcher and cherish the baker and greengrocer. His cardiac work included study with Leonard Hill of the influence of resilience of the arterial wall on blood pressure and an elaborate investigation into the cardiac efficiency of 10,000 recruits with alleged circulatory disturbances. A remarkably complete account of a case of intermittent complete heart-block appeared in our columns two years ago.

In the University of London Russell-Wells's interest was lifelong: the University was his hobby, his constant pre-occupation. He stood always as the champion of the external student, and although he came to realise that the degree of medicine differed from that in other faculties mainly because the course of education as well as the examinational results had to be standardised, he was always opposed to any narrow collegiate conception of University life. He saw the need of a faculty of commerce within the University, and having seen it spent years in working out the course of training and wearing down the difficulties urged against it. For long years a senator, with maximal attendances always recorded against his name, Russell-Wells finally obtained the desire of his heart, and from 1919–22, four critical years in its history, presided over the destinies of the University as its Vice-Chancellor. He represented the University on the General Medical Council and on the retirement of Sir Philip Magnus in 1922 succeeded him as representative in the House of Commons. In the House his voice was not often heard apart from his useful contributions in committee to academic and University affairs, but he was pledged to obtain, if possible, substantial modifications in the panel system, and he was strenuously opposed to any attempt to place the insurance medical service under the domination of the approved societies.

Sir Sydney Russell-Wells's services to education were recognised in 1921 by the conferment of a knighthood. He married in 1895 Harriett, third daughter of the late Stephen Smith, who, with one son and two daughters, survives him. Our sympathy goes out to them in their sudden bereavement.

I have no objection to severe criticism. On the contrary, I like it. It is beneficial to a writer. But I think that your reviewer is hardly entitled to condemn my volume wholesale and accuse me repeatedly of producing "statistical fallacies," a polite way of saying something grossly impolite. I would, therefore, ask your reviewer either to substantiate his accusation or to withdraw it. He owes an explanation rather to your readers than to me, and I trust that in the interests of fair play you will print my letter and give your reviewer space for a reply.

I am, Sir, yours very truly,

July 12th, 1924. J. ELLIS BARKER.

*** Cancer is a disease which has no specific symptoms and no obvious signs, except when a tumour happens to be on the surface of the body. It can be diagnosed with certainty only by microscopic examination either after operation or after death. It increases rapidly with increasing age, and rarely affects young people. In order to make a statistical comparison between the incidence of cancer in different communities it is necessary to know: (1) The size of the population in the community; (2) its age-constitution; (3) the facilities for medical examination and readiness on the part of the community to avail themselves of medical help; (4) the facilities for post-mortem examination, since even with the best medical service available about 30 per cent. of cases of cancer are only recognised at the post-mortem examination. In uncivilised races our knowledge of (1) and (2) is nil, facilities for (4) are nil, and facilities for (3) are much less than in a civilised community. Even between different civilised communities a useful comparison of cancer statistics is impossible unless facilities for (3) and (4) are about equal. As an example of the author's arguments we might refer to p. 27, where, in order to prove that "cancer is increasing in the most startling manner," he compares the death-rate from cancer in England in 1838–42 with that in 1921, and points out that it has increased sevenfold. In 1838–42 Virchow had not lived and pathology as a science did not exist. —ED. L.

CENTENARY OF UNIVERSITY COLLEGE, LONDON.

To the Editor of THE LANCET.

SIR,—The hundredth anniversary of the foundation of University College, London, will be celebrated in 1926. Materials (records, reminiscences, pictures, photographs, &c.) are being collected with a view to the production of a history of the College as a part of the centenary celebrations. The volume will include a chapter on the contribution of the College to medical education and research. Members and friends of the College are invited to send such materials as they can contribute to my care for the use of the historian, who will shortly be appointed. All documents will be carefully marked with the owner's names and will, in due course, be returned unless the owners desire to present them for the College archives. Communications and parcels (marked "Centenary") should be sent to me at the College.

I am, Sir, yours faithfully,

GREGORY FOSTER,
Fellow and Provost.

University College, London, July, 1924.

SCHOOL CLOSURE FOR INFECTIOUS DISEASE.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of May 3rd hits off precisely the views accepted at our public school. Our practice is to let the parents know, while we advise them to allow the boys to remain. Should they remove them, they do so at their own risk. I recall that at the time of King George's coronation, when a week's holiday was granted at most public schools, our school was in the midst of an epidemic of measles. We advised parents that travel was a risk to boys who had not had measles, and we expressed willingness to keep unprotected boys, of whom a few stayed. Although every boy who had not had measles was carefully examined before leaving, at least three developed the disease on their long journey home. One of these nearly died and was never fit for school again. In the influenza outbreak of 1918 all parents were urged not to take their boys home until after the epidemic was over. Only on special request, and with a signed statement that all risks were accepted, was any boy allowed to leave, and only a few went. One who lived in Edinburgh developed influenza on the journey and died of pneumonia. This was the only death in connexion with the school. 410 cases were nursed here, all of which recovered and were able to go home at Christmas. Every house was converted into a hospital; directly a boy complained he was put to bed and examined. The results of these two epidemics would certainly have removed any doubts I may previously have cherished. Further, in the summer of 1922, when we had 127 cases of measles, the school kept going, and every case did well. Of course, a school should have sanatorium accommodation adequate to its numbers, and it is notorious that preparatory and boarding schools are often short of such accommodation, when there is nothing for it but to send the unfortunate children home. Paragraph XXIII. of the Code of Rules drawn up by the Society of Medical Officers of Schools is clear, and I agree with it. As for the elementary schools, the unfortunate medical officer is pretty well bound to close the school when attendances drop, to save financial loss through stoppage of grants.

You will have done good if you wake up public opinion against a practice which results in the school authorities taking fees and doing little or nothing in return except avail themselves of the opportunity to shut down on the outbreak of infectious disease. There is the risk of spreading the particular infection at home.

I am, Sir, yours faithfully,

MEDICAL OFFICER TO A PUBLIC SCHOOL.

July 15th, 1924.

A CHEMICAL ENCYCLOPÆDIA.

To the Editor of THE LANCET.

SIR,—I feel bound to make a protest against the scandalous way in which my Chemical Encyclopædia (third edition) has been dealt with by your reviewer in THE LANCET of July 5th, and would call your attention to the reviews given in the *Chemical Trade Journal* of May 9th and the *Pharmaceutical Journal* of May 17th, both of which are enclosed herewith, and which will show you that the book covers practically the whole areas of chemical science, materials, theory, terms, and its application to chemical industries and chemical engineering. No attempt has ever been made before to produce an encyclopædia covering so much ground and (according to the general consensus of expressed opinions) the task has not been unsuccessfully accomplished; yet your reviewer dismisses such laboriously achieved work with a somewhat contemptuous reference of eight lines.

In conclusion, I would refer you to THE LANCET review of the second edition (which was a work of a much smaller and less comprehensive character) given in your issue of Feb. 18th, 1922, and I hope you will see some way of doing more justice to me in the matter.

I am, Sir, yours faithfully,

Weybridge, July 7th, 1924. C. T. KINGZETT.

*** The works of direct professional interest are now very numerous and our space is chiefly employed in the attempt to notice them fully and promptly. There is nothing contemptuous whatever in a brief review, at least in intention, especially where the work in question is in its third edition.—ED. L.

onset of cancer. The evidence of Mr. T. W. Stuart and Mr. F. A. Johnson, given in my address, seems to prove, as conclusively as personal statements can prove anything, that men who inevitably inhale lead during their work are immune to malignant disease.

Meanwhile, I take up no position in the matter other than that of an inquirer. I have put forward what seems to be suggestive, but not conclusive evidence. I now await the answer. It may be ten years before this can be given. Before that time has elapsed we shall probably have the answer to the whole question. We ourselves may be using some other preparation than lead, which at present is the best agent we can find for destruction of the chorionic epithelium, and, therefore, as we believe, of malignant cells.

I am, Sir, yours faithfully,

Liverpool, July 10th, 1924. W. BLAIR BELL.

EMETINE IN THE TREATMENT OF ALCOHOL AND MORPHINE HABITS.

To the Editor of THE LANCET.

SIR,—In "Hormone Therapy"[1] I advocated hypodermic injections of emetine hydrochloride for alcoholism, and considered it specific for the craving. At that time only 18 to 20 cases had been reported, but since then over 100 cases have been under treatment so that a fuller experience is now available. This added experience has been shared by others. In "Minor Maladies" Dr. Leonard Williams reports success with emetine hydrochloride, but is not prepared to admit its specificity. There are 3 per cent. to 5 per cent. of alcoholic cases who do not respond to the usual injection of one-third of a grain. It is found that by reducing the dose to one-sixth or one-ninth of a grain these patients begin to recover and to exhibit the same improvement as do normal cases with the full dose.

In the treatment of alcoholism the usual routine is to give an injection of one-third of a grain of emetine hydrochlor. every second day for three doses. In some cases it may be found advisable to give one every day for three doses. After the first three the interval between succeeding doses is lengthened by a day. Thus injections are usually given on days—1, 3, 5, 8, 12, 17, 23, 30. This usually constitutes a course, although an injection once a week may be given for some time afterwards if thought advisable. With the emetine injections I give the following mixture :—

℞ Sod. glycerophos... .. .. ʒii.
Mist. pepsin co. c. bism. .. ℥iss.
Hormonax .. .. .. ℥vi.
Aq. menth. pip. ad .. .. ℥xii.
Sig. ℥ss. ex aq. four times a day.

The reason for the increasing interval between the injections is that emetine is cumulative in action. Alcohol is discontinued as soon as possible, for each dose of it weakens the action of the emetine. Four ounces of alcohol may be given for the first 24 hours and the amount reduced by an ounce each day. There may be some elasticity about this rule, but alcohol should be discontinued as early as possible.

The effect on the nervous system is very marked. A man very soon realises that he is getting a grip of himself and the improvement in his personal appearance corresponds. When a case has gone on to delirium tremens there is no better treatment than emetine. The result of each injection should be watched (they should be given daily for several days), and reduced in strength when the symptoms suggest the advisability of this. Also a suitable quantity of bromide may be added to the mixture.

When "Hormone Therapy" was published I had had no experience with emetine except in alcoholic cases, but I suggested its use in morphine and other drug addictions. In the *Medical Press* of Nov. 29th, 1922, Margaret Vivian reported good results in three cases of morphine habit treated with emetine. Since then I have had two cases, both very successful.

R. P., aged 61, medical practitioner, habit of ten years' duration, a debilitated, decrepit man for his years, weight under 100 lb. Was taking 5 to 6 gr. a day. Had tried many treatments without success. Result was that all morphine was discontinued in 14 days, and three weeks later when he was told that he had not had any for three weeks he could scarcely believe it. He had not known when the drug had been withdrawn.

I. A., aged 50, medical practitioner, a very long-standing case of drug addiction. A heavy lethargic man who was taking various amounts up to and over 20 gr. a day. The drug in his case was wholly discontinued in 12 days, and a fortnight later he was told that he had had none all that time. He had not known when morphine had been discontinued.

The change in the general condition of both men was very marked. The first recovered vigour and put on 20 lb. weight, while the second lost his besotted appearance and appeared perfectly normal. The treatment in both was exactly as for alcohol. In each case it was resolved to begin with three grains a day. Two bottles were prepared : (*a*) A four-ounce mixture containing *half a grain* of morphine hydrochloride *in every 20 minims*, and (*b*) an eight-ounce mixture with sufficient quin. sulphat. in it to simulate the taste of (*a*). Six doses of 20 minims each were given every day from (*a*) and the bottle filled up from (*b*). At the end of 12 to 14 days there was so little morphine left in (*a*) that it was put aside and (*b*) alone was used for the remainder of the time.

Some cases may succeed without being put under control, but for uniform results the alcoholic cases should be detained for at least a fortnight and the morphine cases for not less than four weeks. The habits of years are not easily eradicated even although the craving may have disappeared. In such cases, both with alcohol and morphine, there are many who once restored never relapse, but many of the periodical type return for treatment from time to time. The treatment is just as successful in recurrences. Many learn to come at the very onset, and a few injections prevent the usual results.

Shortly, we have in emetine a treatment which destroys the craving for alcohol and morphine, which builds up the patient's whole nervous system, and thus materially aids in the treatment of such drug habits.

I am, Sir, yours faithfully,

D. MONTGOMERIE PATON, L.R.C.P. & S. Edin.

Heidelberg, Victoria, April 11th, 1924.

CANCER: HOW IT IS CAUSED, HOW IT CAN BE PREVENTED.

To the Editor of THE LANCET.

SIR,—In your issue of to-day you print a very brief review of my book on cancer. The reviewer states that my explanation of the causation of cancer is "not new," that I am "very ill-informed on the subject," and he accuses me twice of producing "statistical fallacies." I suppose I must have produced an absolutely rotten book.

Curiously enough, your reviewer's condemnation stands alone. I have received so far approximately 30 reviews of a column or more, printed in the *Times* and other leading papers, and practically unanimously the writers give to my volume the highest praise which can be given to it. It has been a marvellous reception, and the 30 odd eulogies were apparently all written by eminent medical men, some of whom appended their signatures. I would also draw your attention to the fact that Sir Arbuthnot Lane has stated in his introduction the opinion that my book might be considered "easily the most important practical work on cancer existing in English or in any other language." In addition to these printed testimonies, I have received private letters full of praise and of fervent good wishes from a great many leading medical men, and among these letters are two signed by great specialists on cancer.

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[1] Baillière, Tindall and Cox. 1922.

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Fellow and Provost.

University College, London, July, 1924.

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SIR,—The leading article in your issue of May 3rd hits off precisely the views accepted at our public school. Our practice is to let the parents know, while we advise them to allow the boys to remain. Should they remove them, they do so at their own risk. I recall that at the time of King George's coronation, when a week's holiday was granted at most public *schools, our school was in the midst of an epidemic of* measles. We advised parents that travel was a risk to boys who had not had measles, and we expressed willingness to keep unprotected boys, of whom a few stayed. Although every boy who had not had measles was carefully examined before leaving, at least three developed the disease on their long journey home. One of these nearly died and was never fit for school again. In the influenza outbreak of 1918 all parents were urged not to take their boys home until after the epidemic was over. Only on special request, and with a signed statement that all risks were accepted, was any boy allowed to leave, and only a few went. One who lived in Edinburgh developed influenza on the journey and died of pneumonia. This was the only death in connexion with the school. 410 cases were nursed here, all of which recovered and were able to go home at Christmas. Every house was converted into a hospital; directly a boy complained he was put to bed and examined. The results of these two epidemics would certainly have removed any doubts I may previously have cherished. Further, in the summer of 1922, when we had 127 cases of measles, the school kept going, and every case did well. Of course, a school should have sanatorium accommoda*tion adequate to its numbers*, and it is notorious that preparatory and boarding schools are often short of such accommodation, when there is nothing for it but to send the unfortunate children home. Paragraph XXIII. of the Code of Rules drawn up by the Society of Medical Officers of Schools is clear, and I agree with it. As for the elementary schools, the unfortunate medical officer is pretty well bound to close the school when attendances drop, to save financial loss through stoppage of grants.

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July 15th, 1924.

A CHEMICAL ENCYCLOPÆDIA.

To the Editor of THE LANCET.

SIR,—I feel bound to make a protest against the scandalous way in which my Chemical Encyclopædia (third edition) has been dealt with by your reviewer in THE LANCET of July 5th, and would call your attention to the reviews given in the *Chemical Trade Journal* of May 9th and the *Pharmaceutical Journal* of May 17th, both of which are enclosed herewith, and which will show you that the book covers practically the whole areas of chemical science, materials, theory, terms, and its application to chemical industries and chemical engineering. No attempt has ever been made before to produce an encyclopædia covering so much ground and (according to the general consensus of expressed opinions) the task has not been unsuccessfully *accomplished*; yet your reviewer dismisses such laboriously achieved work with a somewhat contemptuous reference of eight lines.

In conclusion, I would refer you to THE LANCET review of the second edition (which was a work of a much smaller and less comprehensive character) given in your issue of Feb. 18th, 1922, and I hope you will see some way of doing more justice to me in the matter.

I am, Sir, yours faithfully,

Weybridge, July 7th, 1924. C. T. KINGZETT.

*** The works of direct professional interest are now very numerous and our space is chiefly employed in the attempt to notice *them fully* and promptly. There is nothing contemptuous whatever in a brief review, at least in intention, especially where the work in question is in its third edition.—ED. L.

onset of cancer. The evidence of Mr. T. W. Stuart and Mr. F. A. Johnson, given in my address, seems to prove, as conclusively as personal statements can prove anything, that men who inevitably inhale lead during their work are immune to malignant disease.

Meanwhile, I take up no position in the matter other than that of an inquirer. I have put forward what seems to be suggestive, but not conclusive evidence. I now await the answer. It may be ten years before this can be given. Before that time has elapsed we shall probably have the answer to the whole question. We ourselves may be using some other preparation than lead, which at present is the best agent we can find for destruction of the chorionic epithelium, and, therefore, as we believe, of malignant cells.

I am, Sir, yours faithfully,

Liverpool, July 10th, 1924. W. BLAIR BELL.

EMETINE IN THE TREATMENT OF ALCOHOL AND MORPHINE HABITS.

To the Editor of THE LANCET.

SIR,—In "Hormone Therapy"[1] I advocated hypodermic injections of emetine hydrochloride for alcoholism, and considered it specific for the craving. At that time only 18 to 20 cases had been reported, but since then over 100 cases have been under treatment so that a fuller experience is now available. This added experience has been shared by others. In "Minor Maladies" Dr. Leonard Williams reports success with emetine hydrochloride, but is not prepared to admit its specificity. There are 3 per cent. to 5 per cent. of alcoholic cases who do not respond to the usual injection of one-third of a grain. It is found that by reducing the dose to one-sixth or one-ninth of a grain these patients begin to recover and to exhibit the same improvement as do normal cases with the full dose.

In the treatment of alcoholism the usual routine is to give an injection of one-third of a grain of emetine hydrochlor. every second day for three doses. In some cases it may be found advisable to give one every day for three doses. After the first three the interval between succeeding doses is lengthened by a day. Thus injections are usually given on days—1, 3, 5, 8, 12, 17, 23, 30. This usually constitutes a course, although an injection once a week may be given for some time afterwards if thought advisable. With the emetine injections I give the following mixture :—

℞ Sod. glycerophos... .. .. ʒii.
Mist. pepsin co. c. bism. .. ℥iss.
Hormonax .. .. .. ℥vi.
Aq. menth. pip. ad .. .. ℥xii.
Sig. ℥ss. ex aq. four times a day.

The reason for the increasing interval between the injections is that emetine is cumulative in action. Alcohol is discontinued as soon as possible, for each dose of it weakens the action of the emetine. Four ounces of alcohol may be given for the first 24 hours and the amount reduced by an ounce each day. There may be some elasticity about this rule, but alcohol should be discontinued as early as possible.

The effect on the nervous system is very marked. A man very soon realises that he is getting a grip of himself and the improvement in his personal appearance corresponds. When a case has gone on to delirium tremens there is no better treatment than emetine. The result of each injection should be watched (they should be given daily for several days), and reduced in strength when the symptoms suggest the advisability of this. Also a suitable quantity of bromide may be added to the mixture.

When "Hormone Therapy" was published I had had no experience with emetine except in alcoholic cases, but I suggested its use in morphine and other drug addictions. In the *Medical Press* of Nov. 29th, 1922, Margaret Vivian reported good results in three cases of morphine habit treated with emetine. Since then I have had two cases, both very successful.

R. P., aged 61, medical practitioner, habit of ten years' duration, a debilitated, decrepit man for his years, weight under 100 lb. Was taking 5 to 6 gr. a day. Had tried many treatments without success. Result was that all morphine was discontinued in 14 days, and three weeks later when he was told that he had not had any for three weeks he could scarcely believe it. He had not known when the drug had been withdrawn.

I. A., aged 50, medical practitioner, a very long-standing case of drug addiction. A heavy lethargic man who was taking various amounts up to and over 20 gr. a day. The drug in his case was wholly discontinued in 12 days, and a fortnight later he was told that he had had none all that time. He had not known when morphine had been discontinued.

The change in the general condition of both men was very marked. The first recovered vigour and put on 20 lb. weight, while the second lost his besotted appearance and appeared perfectly normal. The treatment in both was exactly as for alcohol. In each case it was resolved to begin with three grains a day. Two bottles were prepared : (*a*) A four-ounce mixture containing *half a grain* of morphine hydrochloride *in every 20 minims*, and (*b*) an eight-ounce mixture with sufficient quin. sulphat. in it to simulate the taste of (*a*). Six doses of 20 minims each were given every day from (*a*) and the bottle filled up from (*b*). At the end of 12 to 14 days there was so little morphine left in (*a*) that it was put aside and (*b*) alone was used for the remainder of the time.

Some cases may succeed without being put under control, but for uniform results the alcoholic cases should be detained for at least a fortnight and the morphine cases for not less than four weeks. The habits of years are not easily eradicated even although the craving may have disappeared. In such cases, both with alcohol and morphine, there are many who once restored never relapse, but many of the periodical type return for treatment from time to time. The treatment is just as successful in recurrences. Many learn to come at the very onset, and a few injections prevent the usual results.

Shortly, we have in emetine a treatment which destroys the craving for alcohol and morphine, which builds up the patient's whole nervous system, and thus materially aids in the treatment of such drug habits.

I am, Sir, yours faithfully,

D. MONTGOMERIE PATON, L.R.C.P. & S. Edin.

Heidelberg, Victoria, April 11th, 1924.

CANCER: HOW IT IS CAUSED, HOW IT CAN BE PREVENTED.

To the Editor of THE LANCET.

SIR,—In your issue of to-day you print a very brief review of my book on cancer. The reviewer states that my explanation of the causation of cancer is "not new," that I am "very ill-informed on the subject," and he accuses me twice of producing "statistical fallacies." I suppose I must have produced an absolutely rotten book.

Curiously enough, your reviewer's condemnation stands alone. I have received so far approximately 30 reviews of a column or more, printed in the *Times* and other leading papers, and practically unanimously the writers give to my volume the highest praise which can be given to it. It has been a marvellous reception, and the 30 odd eulogies were apparently all written by eminent medical men, some of whom appended their signatures. I would also draw your attention to the fact that Sir Arbuthnot Lane has stated in his introduction the opinion that my book might be considered "easily the most important practical work on cancer existing in English or in any other language." In addition to these printed testimonies, I have received private letters full of praise and of fervent good wishes from a great many leading medical men, and among these letters are two signed by great specialists on cancer.

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[1] Baillière, Tindall and Cox. 1922.

I have no objection to severe criticism. On the contrary, I like it. It is beneficial to a writer. But I think that your reviewer is hardly entitled to condemn my volume wholesale and accuse me repeatedly of producing "statistical fallacies," a polite way of saying something grossly impolite. I would, therefore, ask your reviewer either to substantiate his accusation or to withdraw it. He owes an explanation rather to your readers than to me, and I trust that in the interests of fair play you will print my letter and give your reviewer space for a reply.

I am, Sir, yours very truly,

July 12th, 1924. J. ELLIS BARKER.

*** Cancer is a disease which has no specific symptoms and no obvious signs, except when a tumour happens to be on the surface of the body. It can be diagnosed with certainty only by microscopic examination either after operation or after death. It increases rapidly with increasing age, and rarely affects young people. In order to make a statistical comparison between the incidence of cancer in different communities it is necessary to know: (1) The size of the population in the community; (2) its age-constitution; (3) the facilities for medical examination and readiness on the part of the community to avail themselves of medical help; (4) the facilities for post-mortem examination, since even with the best medical service available about 30 per cent. of cases of cancer are only recognised at the post-mortem examination. In uncivilised races our knowledge of (1) and (2) is nil, facilities for (4) are nil, and facilities for (3) are much less than in a civilised community. Even between different civilised communities a useful comparison of cancer statistics is impossible unless facilities for (3) and (4) are about equal. As an example of the author's arguments we might refer to p. 27, where, in order to prove that "cancer is increasing in the most startling manner," he compares the death-rate from cancer in England in 1838–42 with that in 1921, and points out that it has increased sevenfold. In 1838–42 Virchow had not lived and pathology as a science did not exist. —ED. L.

CENTENARY OF UNIVERSITY COLLEGE, LONDON.

To the Editor of THE LANCET.

SIR,—The hundredth anniversary of the foundation of University College, London, will be celebrated in 1926. Materials (records, reminiscences, pictures, photographs, &c.) are being collected with a view to the production of a history of the College as a part of the centenary celebrations. The volume will include a chapter on the contribution of the College to medical education and research. Members and friends of the College are invited to send such materials as they can *contribute* to my care for the use of the historian, who will shortly be appointed. All documents will be carefully marked with the owner's names and will, in due course, be returned unless the owners desire to present them for the College archives. Communications and parcels (marked "Centenary") should be sent to me at the College.

I am, Sir, yours faithfully,

GREGORY FOSTER,
Fellow and Provost.

University College, London, July, 1924.

SCHOOL CLOSURE FOR INFECTIOUS DISEASE.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of May 3rd hits off precisely the views accepted at our public school. Our practice is to let the parents know, while we advise them to allow the boys to remain. Should they remove them, they do so at their own risk. I recall that at the time of King George's coronation, when a week's holiday was granted at most public schools, our school was in the midst of an epidemic of measles. We advised parents that travel was a risk to boys who had not had measles, and we expressed willingness to keep unprotected boys, of whom a few stayed. Although every boy who had not had measles was carefully examined before leaving, at least three developed the disease on their long journey home. One of these nearly died and was never fit for school again. In the influenza outbreak of 1918 all parents were urged not to take their boys home until after the epidemic was over. Only on special request, and with a signed statement that all risks were accepted, was any boy allowed to leave, and only a few went. One who lived in Edinburgh developed influenza on the journey and died of pneumonia. This was the only death in connexion with the school. 410 cases were nursed here, all of which recovered and were able to go home at Christmas. Every house was converted into a hospital; directly a boy complained he was put to bed and examined. The results of these two epidemics would certainly have removed any doubts I may previously have cherished. Further, in the summer of 1922, when we had 127 cases of measles, the school kept going, and every case did well. Of course, a school should have sanatorium accommodation adequate to its numbers, and it is notorious that preparatory and boarding schools are often short of such accommodation, when there is nothing for it but to send the unfortunate children home. Paragraph XXIII. of the Code of Rules drawn up by the Society of Medical Officers of Schools is clear, and I agree with it. As for the elementary schools, the unfortunate medical officer is pretty well bound to close the school when attendances drop, to save financial loss through stoppage of grants.

You will have done good if you wake up public opinion against a practice which results in the school authorities taking fees and doing little or nothing in return except avail themselves of the opportunity to shut down on the outbreak of infectious disease. There is the risk of spreading the particular infection at home.

I am, Sir, yours faithfully,

MEDICAL OFFICER TO A PUBLIC SCHOOL.

July 15th, 1924.

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Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Public Health in Scotland.

SPEAKING in the House of Commons on July 3rd on a vote of £1,897,832 to complete the sum necessary to defray the salaries and expenses of the Scottish Board of Health, Mr. JAMES STEWART (Parliamentary Under-Secretary of Health for Scotland) reported that the year 1923, measured by the death-rate, was the healthiest year on record. The general death-rate fell to the low figure of 12·9 per 1000 of the population, the lowest previous rate being 13·6 per 1000 in 1921. Realising the importance of the health services of the country, one of the first actions of the Government had been to remove the embargo placed on the development of those services by the late Government, and the local authorities had responded to their action by submitting for the approval of the Board of Health developments and extensions of schemes which had been hung up owing to the embargo. It must be their aim to use to the fullest extent the resources of medical and sanitary science in diminishing the heavy burden of sickness, a large part of which was capable of being treated on preventive lines. In addition to measures for better housing, it was necessary to prevent the pollution of the atmosphere by smoke. He hoped a Bill dealing with smoke abatement in Scotland would be introduced at an early date.

There was increasing evidence that the shortage of hospital accommodation in Scotland was a serious gap in the community's protective organisation against disease. Some steps must be taken to repair it by securing closer coöperation between the voluntary hospitals and the Poor-law and public health hospitals. Impressed with the importance of the subject, the Board of Health had recently appointed a Departmental Committee, presided over by Lord Mackenzie, " to inquire into and to report upon the extent and nature of the inadequacy of the present hospital and ancillary services in Scotland, and to make recommendations for the development and maintenance of these services to meet the needs of the community."

Mortality from Tuberculosis.

Slowly but steadily the mortality from tuberculosis was lessening. In 1914 the deaths from that disease numbered 7696, whereas in 1923 they had fallen to 5786. In 1894 the death-rate in Scotland from pulmonary tuberculosis was 172 per 100,000 of the population; in 1914 the corresponding rate had fallen to 104, and in 1923 it had been still further reduced to 81. In respect of pulmonary tuberculosis Scotland had now a lower death-rate than England and Ireland. In the same period of 30 years the death-rate from non-pulmonary tuberculosis had fallen from 63 per 100,000 of the population in 1894 to 58 in 1914 and 36 in 1923. Notwithstanding the fact that the death-rate from this form of the disease showed a fall of 38 per cent. since 1914, Scotland occupied the unenviable position of having the highest death-rate of any of the three countries from non-pulmonary tuberculosis. But he had great hopes that the efforts of the local authorities would soon produce beneficial results which would be reflected in a still further substantial diminution of the death-rate.

There had been a substantial addition to the number of sanatorium and hospital beds reserved for the treatment of this disease. In 1918, at the close of the war, the number of such beds was 2590; to-day there were 3953 beds, and when the extensions, particularly in Glasgow, were finished they would have over 4800 beds reserved for the treatment of this disease. Local authorities must be encouraged to carry on and extend their activities where necessary. The local authorities would now receive in grant 50 per cent. of all reasonable expenditure in connexion with the treatment of this disease.

Maternity and Child Welfare.

With regard to maternity and child welfare in 1923, the deaths under 1 year numbered 80,825, equivalent to a death-rate of 78·9 per 1000 births. This was the lowest infantile death-rate ever recorded for Scotland. The deaths for 1923 over 1 year and under 5 years numbered 4926, equivalent to 12·3 per 1000 children within those ages. Here, again, the death-rate was the lowest on record for Scotland. In 1915 14,441 infants died under 1 year, equivalent to a death-rate of 126·5 per 1000 births, and 9120 children from 1 year to 5 years died, equal to a death-rate of 22·5 per 1000 children of those ages. Unfortunately, while the process of reducing the mortality among infants had been continuous, it was far from being a steady progress. In the first quarter of 1924 the infantile mortality-rate in Scotland rose to 132 per 1000 births, against 98 for the corresponding quarter in 1923. Only in June did the death-rate among children return to a less alarming level. In large measure this high mortality was due to a widespread epidemic of measles and whooping-cough, and to other diseases such as pneumonia that followed these infections. The Scottish Board of Health had issued a circular to local authorities with regard to the further control and treatment of these epidemic diseases, and a special sum of £10,000 had been set aside as part of the maternity and child welfare grant which would be distributed in a manner designed to encourage local authorities to institute further measures for the preservation of child life from the ravages of these very deadly diseases.

A special inquiry in 1908 revealed the following general facts regarding measles, which, like tuberculosis, was a poverty disease. The death-rate from measles in one-room houses was 92, in two-room houses it was 46, in three-room houses it was 25, and in four rooms and over it was 15. The Board proposed to make the disease notifiable, appoint a special *ad hoc* staff of visiting nurses for infectious diseases, increased hospital facilities, and an increased service of health visitors. In 1923 a committee was appointed to inquire into puerperal morbidity and mortality. The deaths of women in childbirth in Scotland numbered over 700 annually, and the amount of sickness and disablement which did not result in death was very great. In their report the Committee expressed with confidence the view that puerperal morbidity and mortality were largely avoidable and could be reduced by improvement of the midwifery service and by the provision of antenatal care for the expectant mother. The Board had invited local authorities to submit detailed proposals on the lines suggested by the Committee.

No restriction would be placed on the development of maternity service and child welfare schemes otherwise provided that the Board were satisfied with the proposals on the merits. The rationing scheme for calculating grant on food and milk expenditure had now been withdrawn and grant was paid at the full rate of 10*s.* per £ on expenditure, supported by the certificate of a responsible medical officer that he considered after examination that additional nourishment was necessary.

The opening of new venereal disease centres was proceeding steadily, but it was disquieting to observe that no less than 53 per cent. of patients discontinued treatment without the sanction of the medical officer. This fact made it necessary to consider whether local authorities did not require further powers to deal more effectively with venereal disease.

" Sleeping sickness " was increasing. It was hoped that investigations that were being made would before long lead to the discovery of an effective method of treatment. During 1923 and the current year a number of cases of infective jaundice had occurred in East Lothian and Midlothian. The majority of those affected were miners, and all worked in the neighbourhood of two contiguous pits. There had been 15 cases and four deaths. The disease was associated with a disease of rats, which was due to the same organism, and though it had not been definitely settled how the disease was conveyed from rat to man, it was necessary that as far as possible rats should be trapped and killed and their access to the pits prevented. The matter of infective jaundice was being dealt with by the Medical Research Department and had now been referred to the Mines Department. The Board were awaiting the result. In conclusion, Mr. Stewart referred to the distress in the Highlands and Islands, and said that the Board were paying attention to this matter in the hope that in the near future they might be able to make recommendations dealing with the general health of the community in the direction of solving this problem.

HOUSE OF LORDS.

MONDAY, JULY 14TH.

Royal Commission on Lunacy.

THE LORD CHANCELLOR moved the following :—" In order to bring the Tribunals of Inquiry (Evidence) Act, 1921, into operation, it is expedient that a tribunal be established for inquiring into (1) the existing law and administrative machinery in England and Wales in connexion with the certification, detention, and care of persons who are or are alleged to be of unsound mind; and (2) the extent to which provision is or should be made in England and Wales for the treatment without certification of persons suffering from mental disorder." He explained that the object of the motion was to enable the Royal Commission on Lunacy to call witnesses and examine them on oath. The motion was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, JULY 9TH.

Medical Test of Temporary Civil Servants.

Mr. HORE-BELISHA asked the Parliamentary Secretary to the Admiralty, with reference to the examination which was contemplated for ex-Service men employed as temporary civil servants under the Admiralty, whether he was aware of the great hardship which such examination imposed upon those who had done good service to the country, and why they had now to submit to an educational, departmental, and medical test to ascertain whether they were fit for retention in their present capacity, although they had given every satisfaction and had demonstrated their ability; and whether he could exempt these men from the examination proposed or their dismissal as the result of such examination.—Mr. AMMON replied: The examination which was held on July 3rd was of a comparatively simple character and suited to the age of the ex-Service competitors, and should not have imposed great hardship on any of the candidates. Appointments of temporary clerks to the clerical grades of the Civil Service are made by examination and this practice has been endorsed by Lord Southborough's Committee in its final report. No person can be given an established post until he has satisfied the Civil Service Commissioners of his physical fitness, amongst other factors. As I have already explained to the hon. Member, there is provision for the medical standard to be relaxed in the favour of men whose health has been impaired as a result of service in the forces in the late war.

New Mental Hospitals.

Mr. ROBERT RICHARDSON asked the Minister of Health what schemes were in contemplation for the building of new asylums and other mental institutions; in view of the declaration in 1922 of a surplus of 18,000 beds, would he explain why such extension was necessary; and whether it was the intention of the Board of Control to offer this increased accommodation to uncertified cases for the purpose of retaining them under their own authority instead of encouraging the provision of hospitals apart from lunacy, and run by the health committees of local authorities for the benefit of slight and non-dangerous cases, where they could recover without risk of stigma.—Mr. WHEATLEY replied: Only one scheme for the building of a new mental hospital is in contemplation, but further accommodation will be needed in the near future. The figure of 18,000 beds was an estimate made at the end of 1920; but, for various reasons, certain schemes then foreshadowed were not proceeded with. On Jan. 1st in the present year there were, in fact, only 4754 vacant beds. As the average annual increase of certified patients during the last two years has been at the rate of 3266, it is obvious that further provision is necessary. The question whether provision should be made for the early treatment of cases of mental disorder without certification is one of the principal matters referred to the Royal Commission recently appointed.

Hendon Institute Lymph.

Mr. BLACK asked the Minister of Health whether any records had been kept showing the pedigree of the lymph used at the Hendon Institute.—Mr. WHEATLEY replied: Yes, Sir.

Court of Appeal for Certified Lunatics.

Mr. ROBERT RICHARDSON asked the Minister of Health if his attention had been called to the remarks of Lord Justice Scrutton, on the occasion of the appeal against Harnett, in regard to the necessity for a thorough examination into the grounds on which an alleged lunatic was imprisoned as well as the desirability that he should at certain intervals during detention have the opportunity of demanding an independent investigation into his case; and, in the interests of justice to the public, would he take steps to institute a court of appeal for those imprisoned in asylums, after the analogy of the court of appeal provided for other classes of prisoners.—Mr. WHEATLEY replied: The points raised in this question come within the terms of reference of the Royal Commission on Lunacy and Mental Disorder, which has just been appointed; and any action in the matter should, I think, be deferred until the Royal Commission has reported.

Bodies of Paupers for Medical Dissection.

Mr. PENNY asked the Minister of Health whether he was aware that his department had officially approached the Kingston board of guardians with a view to making arrangements for that authority to hand over the bodies of dead friendless paupers to the London hospitals for dissection purposes; in view of the odium which such a step threw upon the guardians, many of whom were averse to the proposal, would he reconsider the whole matter, and would he say whether similar overtures had been made to other boards of guardians throughout the country.—Mr. WHEATLEY replied: Yes, Sir, the application to Kingston guardians was made with my authority and in this matter I have followed the invariable practice of my predecessors of all parties and of successive Home Secretaries with whom the responsibility under the Anatomy Acts rested prior to the transfer of this duty to the Minister of Health. I recognise the very natural objections which such a proposal must at first sight provoke, but I am satisfied that there is no alternative which would not have disastrous effects on surgical and medical education, and ultimately on the treatment of the sick. The effective teaching of anatomy and operative surgery, which form an essential part of medical education, will become impossible unless the necessary subjects can be made available for practical instruction. If anatomy cannot be taught by the examination of the dead it will have to be learned by experiment on the living; and except in the case of the comparatively small number of students who could afford to go abroad for their anatomical study, young practitioners would be compelled to acquire by experimenting on their patients the knowledge which it would have been impossible to impart to them in the medical schools. Many other unions throughout the country, including those adjacent to Kingston, are coöperating with the department in this matter, and I am glad to learn that it is generally recognised by the guardians that the poor would be the first to suffer if medical students could not obtain the necessary teaching without going abroad for it. I would add that the Anatomy Acts contain detailed provisions as to the conditions under which bodies are to be used for this purpose, and these provisions are stringently enforced under the constant supervision of H.M. Inspector of Anatomy. All bodies used for this purpose are duly interred within the prescribed period after a religious service appropriate to the denomination to which the deceased belonged and the place of burial is carefully recorded. It is impracticable to rely for this purpose upon those who voluntarily leave their bodies by will to be used for anatomical teaching, since the number is wholly insufficient. I would add that the reason for seeking the coöperation of the guardians is not the poverty of the persons concerned, but the fact that they have no known or traceable relatives to claim the body for burial, and therefore there is no one to be distressed by the use of the body for purposes which are vitally necessary to the proper teaching of medicine.

Deaths from Small-pox, &c.

Mr. GILBERT asked the Minister of Health how many deaths had been registered this year from small-pox, measles, pneumonia, scarlet fever, diphtheria, influenza, and encephalitis lethargica.—Mr. WHEATLEY replied: According to the provisional figures received by the Registrar-General, the deaths registered in England and Wales in the quarter ended March 31st last included: Small-pox 3, measles 1741, scarlet fever 263, diphtheria 742, encephalitis lethargica 229. No separate figures are at present available of deaths from pneumonia or deaths from influenza. The returns for the second quarter ended June 30th are only now being received, and the corresponding figures for that quarter cannot yet be given, but I will furnish the hon. Member with these figures as soon as they are available.

Women Medical Officers and Antenatal Clinics.

Mr. COSTELLO asked the Minister of Health whether he was aware that in certain districts the antenatal and other clinics were not so successful as they otherwise would be, owing to a natural disinclination on the part of many women to go themselves or to take their adolescent daughters to clinics which were under the charge of men medical officers or assistant medical officers of health, especially in those districts where there was a woman assistant medical officer available for such work; and whether he will take steps to ensure that, at any rate in districts where there were already women assistant medical officers, the work in connexion with women and the older girls should be undertaken by the women medical officers and not by the men, and that upon vacancies occurring in public health appointments, the duties of which consisted wholly or mainly of the kind of work above mentioned, such vacancies should be filled by women in preference to men.—Mr. WHEATLEY replied: I have no information to support the statement in the first part of the question. As regards the second part, while I favour the employment of women medical officers to take charge of antenatal clinics, I am not prepared to require that this should be done in all cases.

Free Supply of Insulin by Poor-law Authorities.

Captain REGINALD TERRELL asked the Minister of Health if, in view of the reduction of the price of insulin, it was supplied free by all Poor-law authorities on the recommendation of their respective medical officers.—Mr. WHEATLEY replied: I have no reason to suppose that Poor-law authorities are not supplying insulin in all proper cases in which application is made to them and supported by their medical officers.

Women Workers in Hospitals.

Miss JEWSON asked the Minister of Pensions whether the recent reduction in the wages of women working in hospitals run by the Ministry of Pensions had been general; and, if so, on whose instructions.—Mr. J. W. MUIR (Parliamentary Secretary to the Ministry of Pensions) replied: No general reduction has been made in the rates of pay of women employed in Ministry institutions; but in view of the fall in the cost of living since these rates were originally fixed

Parliamentary Intelligence.

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Public Health in Scotland.

SPEAKING in the House of Commons on July 3rd on a vote of £1,897,832 to complete the sum necessary to defray the salaries and expenses of the Scottish Board of Health, Mr. JAMES STEWART (Parliamentary Under-Secretary of Health for Scotland) reported that the year 1923, measured by the death-rate, was the healthiest year on record. The general death-rate fell to the low figure of 12·9 per 1000 of the population, the lowest previous rate being 13·6 per 1000 in 1921. Realising the importance of the health services of the country, one of the first actions of the Government had been to remove the embargo placed on the development of those services by the late Government, and the local authorities had responded to their action by submitting for the approval of the Board of Health developments and extensions of schemes which had been hung up owing to the embargo. It must be their aim to use to the fullest extent the resources of medical and sanitary science in diminishing the heavy burden of sickness, a large part of which was capable of being treated on preventive lines. In addition to measures for better housing, it was necessary to prevent the pollution of the atmosphere by smoke. He hoped a Bill dealing with smoke abatement in Scotland would be introduced at an early date.

There was increasing evidence that the shortage of hospital accommodation in Scotland was a serious gap in the community's protective organisation against disease. Some steps must be taken to repair it by securing closer coöperation between the voluntary hospitals and the Poor-law and public health hospitals. Impressed with the importance of the subject, the Board of Health had recently appointed a Departmental Committee, presided over by Lord Mackenzie, "to inquire into and to report upon the extent and nature of the inadequacy of the present hospital and ancillary services in Scotland, and to make recommendations for the development and maintenance of these services to meet the needs of the community."

Mortality from Tuberculosis.

Slowly but steadily the mortality from tuberculosis was lessening. In 1914 the deaths from that disease numbered 7696, whereas in 1923 they had fallen to 5786. In 1894 the death-rate in Scotland from pulmonary tuberculosis was 172 per 100,000 of the population; in 1914 the corresponding rate had fallen to 104, and in 1923 it had been still further reduced to 81. In respect of pulmonary tuberculosis Scotland had now a lower death-rate than England and Ireland. In the same period of 30 years the death-rate from non-pulmonary tuberculosis had fallen from 63 per 100,000 of the population in 1894 to 58 in 1914 and 36 in 1923. Notwithstanding the fact that the death-rate from this form of the disease showed a fall of 38 per cent. since 1914, Scotland occupied the unenviable position of having the highest death-rate of any of the three countries from non-pulmonary tuberculosis. But he had great hopes that the efforts of the local authorities would soon produce beneficial results which would be reflected in a still further substantial diminution of the death-rate.

There had been a substantial addition to the number of sanatorium and hospital beds reserved for the treatment of this disease. In 1918, at the close of the war, the number of such beds was 2590; to-day there were 3953 beds, and when the extensions, particularly in Glasgow, were finished they would have over 4800 beds reserved for the treatment of this disease. Local authorities must be encouraged to carry on and extend their activities where necessary. The local authorities would now receive in grant 50 per cent. of all reasonable expenditure in connexion with the treatment of this disease.

Maternity and Child Welfare.

With regard to maternity and child welfare in 1923, the deaths under 1 year numbered 80,825, equivalent to a death-rate of 78·9 per 1000 births. This was the lowest infantile death-rate ever recorded for Scotland. The deaths for 1923 over 1 year and under 5 years numbered 4926, equivalent to 12·3 per 1000 children within those ages. Here, again, the death-rate was the lowest on record for Scotland. In 1915 14,441 infants died under 1 year, equivalent to a death-rate of 126·5 per 1000 births, and 9120 children from 1 year to 5 years died, equal to a death-rate of 22·5 per 1000 children of those ages. Unfortunately, while the process of reducing the mortality among infants had been continuous, it was far from being a steady progress. In the first quarter of 1924 the infantile mortality-rate in Scotland rose to 132 per 1000 births, against 98 for the corresponding quarter in 1923. Only in June did the death-rate among children return to a less alarming level. In large measure this high mortality was due to a widespread epidemic of measles and whooping-cough, and to other diseases such as pneumonia that followed these infections. The Scottish Board of Health had issued a circular to local authorities with regard to the further control and treatment of these epidemic diseases, and a special sum of £10,000 had been set aside as part of the maternity and child welfare grant which would be distributed in a manner designed to encourage local authorities to institute further measures for the preservation of child life from the ravages of these very deadly diseases.

A special inquiry in 1908 revealed the following general facts regarding measles, which, like tuberculosis, was a poverty disease. The death-rate from measles in one-room houses was 92, in two-room houses it was 46, in three-room houses it was 25, and in four rooms and over it was 15. The Board proposed to make the disease notifiable, appoint a special *ad hoc* staff of visiting nurses for infectious diseases, increased hospital facilities, and an increased service of health visitors. In 1923 a committee was appointed to inquire into puerperal morbidity and mortality. The deaths of women in childbirth in Scotland numbered over 700 annually, and the amount of sickness and disablement which did not result in death was very great. In their report the Committee expressed with confidence the view that puerperal morbidity and mortality were largely avoidable and could be reduced by improvement of the midwifery service and by the provision of antenatal care for the expectant mother. The Board had invited local authorities to submit detailed proposals on the lines suggested by the Committee.

No restriction would be placed on the development of maternity service and child welfare schemes otherwise provided that the Board were satisfied with the proposals on the merits. The rationing scheme for calculating grant on food and milk expenditure had now been withdrawn and grant was paid at the full rate of 10*s.* per £ on expenditure, supported by the certificate of a responsible medical officer that he considered after examination that additional nourishment was necessary.

The opening of new venereal disease centres was proceeding steadily, but it was disquieting to observe that no less than 53 per cent. of patients discontinued treatment without the sanction of the medical officer. This fact made it necessary to consider whether local authorities did not require further powers to deal more effectively with venereal disease.

"Sleeping sickness" was increasing. It was hoped that investigations that were being made would before long lead to the discovery of an effective method of treatment. During 1923 and the current year a number of cases of infective jaundice had occurred in East Lothian and Midlothian. The majority of those affected were miners, and all worked in the neighbourhood of two contiguous pits. There had been 15 cases and four deaths. The disease was associated with a disease of rats, which was due to the same organism, and though it had not been definitely settled how the disease was conveyed from rat to man, it was necessary that as far as possible rats should be trapped and killed and their access to the pits prevented. The matter of infective jaundice was being dealt with by the Medical Research Department and had now been referred to the Mines Department. The Board were awaiting the result. In conclusion, Mr. Stewart referred to the distress in the Highlands and Islands, and said that the Board were paying attention to this matter in the hope that in the near future they might be able to make recommendations dealing with the general health of the community in the direction of solving this problem.

HOUSE OF LORDS.

MONDAY, JULY 14TH.

Royal Commission on Lunacy.

THE LORD CHANCELLOR moved the following:—"In order to bring the Tribunals of Inquiry (Evidence) Act, 1921, into operation, it is expedient that a tribunal be established for inquiring into (1) the existing law and administrative machinery in England and Wales in connexion with the certification, detention, and care of persons who are or are alleged to be of unsound mind; and (2) the extent to which provision is or should be made in England and Wales for the treatment without certification of persons suffering from mental disorder." He explained that the object of the motion was to enable the Royal Commission on Lunacy to call witnesses and examine them on oath. The motion was agreed to.

HOUSE OF COMMONS.

WEDNESDAY, JULY 9TH.

Medical Test of Temporary Civil Servants.

Mr. HORE-BELISHA asked the Parliamentary Secretary to the Admiralty, with reference to the examination which was contemplated for ex-Service men employed as temporary civil servants under the Admiralty, whether he was aware

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council of the College Sir John Bland-Sutton was re-elected President and Mr. H. J. Waring re-elected and Mr. Walter G. Spencer elected Vice-Presidents for the ensuing year. Mr. W. McAdam Eccles, Mr. Wilfred Trotter, and Sir Charles Gordon-Watson, having been duly elected at the meeting of Fellows on July 3rd, were introduced and took their seats as members of the Council. Mr. Donald Kennedy Cassels, B.A. Camb., was appointed Assistant to the Secretary during the ensuing year. Mr. R. H. Burne was re-elected Pathological Curator and Sir Frank Colyer was re-elected Hon. Curator of the Odontological Collection. Mr. Cecil F. Beadles was reappointed Assistant Pathological Curator and Mr Clement E. Shattock was reappointed Pathological Assistant in the Museum for the ensuing year.—On the advice of the Museum Committee the office of Pathological Curator of the Museum was left vacant for the present. Mr. T. W. P. Lawrence, F.R.C.S., was invited to advise and assist in rearranging and revising the series of special pathology in the Museum.—It was announced that the Library of the College would be closed in August as well as in September for the purpose of cleaning and re-decorating.—A letter of July 3rd was read from the Chairman of the Lister Memorial Committee reporting that thr Lister Medal for distinguished contributions to surgical science had been awarded to Sir W. Watson Cheyne, Bart., and that, in compliance with the conditions of the Trust, Sir Watson Cheyne had undertaken to give an address at the Royal College of Surgeons on some date in 1925 convenient to the President and Council.

The following gentlemen were elected professors and lecturers for the ensuing year:—

Hunterian Professors.—Sir Arthur Keith: Six lectures on the Evolution of the Higher Primates. R. Lawford Knaggs: One lecture on Osteitis Deformans and its Connexion with Osteitis Fibrosa and Osteomalacia. V. Zachary Cope: One lecture on Extravasation of Bile. A. Herapath Todd: One lecture on Syphilitic Arthritis. Victor E. Negus: One lecture on Disorders of the Mechanism of the Larynx. H. P. Winsbury White: One lecture on the Pathology of Hydronephrosis. Stanford Cade: One lecture on Regional Anæsthesia.

Arris and Gale Lecturers.—Cecil P. G. Wakeley: One lecture on the Ætiology, Pathology, and Treatment of Ectopic and Imperfect Descent of the Testis. George Scott Williamson: Two lectures on the Anatomy and Physiology of the Thyroid Apparatus.

Erasmus Wilson Lecturer.—Gilbert W. de Poulton Nicholson: Three lectures on the Nature of Tumour Formation.

Arnott Demonstrator.—Sir Arthur Keith: Six demonstrations on the Contents of the Museum.

Licences to practise dentistry were conferred upon the following 63 candidates, who have passed the requisite examinations and have complied with the by-laws:—

L. P. Allen, London; L. N. Alley, Manchester; P. R. Asplet, Manchester and Royal Dental; J. Badenhorst, Royal Dental; E. A. Balkwill, Birmingham; W. J. Barnard, Guy's; D. C. Blyth, Royal Dental; W. R. Booth, London; W. L. Breese, Royal Dental; D. F. G. Came, Middlesex; H. Cantor and P. L. Carnall, London; S. D. Cloete, Royal Dental; A. Critchley, Manchester; E. J. B. Curtis, Guy's; J. M. Davies, Univ. Coll.; A. E. Davis and C. E. Day, Royal Dental; R. S. De Bruyn, Guy's; M. B. Deverell and A. Dreaper, Royal Dental; P. J. Du Toit and E. F. Farmer, Guy's; A. Fleming, Durham; C. H. Fox and W. H. Foy, Guy's; P. D. Gausden, London; E. E. Gibson, Guy's; Sarah Glasstone, Univ. Coll.; F. H. Goddard, Guy's; J. F. Godfrey, Birmingham; H. E. Hovell and V. W. Humpherson, Royal Dental; K. Huxtable, Bristol; N. H. Jenkins, Royal Dental; A. F. King, Guy's; F. W. Lambert and A. P. McClare, London; M. Marais, Royal Dental; P. M. Margand, Univ. Coll.; J. W. Mitchell, London; F. E. Padgett and L. Page, Royal Dental; Marjorie E. C. Page, Univ. Coll.; N. Parkinson and K. F. Pelley, Guy's; H. L. Pretty, London; P. Rosen, Royal Dental; J. C. Rowbotham, Guy's; C. G. Searle, Univ. Coll.; W. H. Shapland, London; Ita N. Shatz, Royal Dental; N. H. Simmonds, Bristol; M. Sperber, S. G. A. Stephenson, and B. J. Swyer, London; J. H. Threlfall, Univ. Coll.; G. G. T. Tregarthen, Guy's; W. A. Turner, Royal Dental; H. P. R. Williams, Guy's; R. N. Winnett, London; R. Woodcock, Sheffield; and B. Woolich, London.

The undermentioned diplomas were conferred (in conjunction with the Royal College of Physicians of London):—

Diploma in Public Health.—H. L. Barker and Joyce R. Batten, Univ. Coll.; W. G. Booth, King's Coll.; L. P. Costobadie, Cambridge and Manchester; A. Crawford, Glasgow and Roy. Inst. Public Health; B. B. Dalal, Bombay and Univ. Coll.; Edith M. P. Davies, Royal Free and King's Coll.; S. R. E. Davies, Cambridge and St. Bart.'s; Helen M. Du Buisson, King's Coll.; Mary Esslemont, Aberdeen and King's Coll.; Gwladys Evans, Univ. Coll.; Dorothy J. L. Gillie, Glasgow and Univ. Coll.; P. C. C. Garnham, St. Bart.'s; G. M. Hargreaves, [illegible] and Univ. Coll.; Marjorie C. Hankins, Roy. Inst. Public Health; N. R. Jenkins, Cardiff and Roy. Inst. Public Health; Elspeth H. R. Livingstone, Edinburgh and Univ. Coll.; V. A. Luna, Guy's and Univ. Coll.; Kathleen F. Matthews, Univ. Coll.; Alice D. Pocock, Royal Free and Univ. Coll.; A. T. W. Powell, Guy's; I. N. O. Price, Univ. Coll.; Violet Reade, Royal Free and King's Coll.; Grace Stevenson, Otago and Univ. Coll.; Emma M. Store, Royal Free and Univ. Coll.; E. Tagoe, Cambridge and Univ. Coll.; Blanchette Thomas, Univ. Coll.; P. Thwaites, St. Bart.'s; E. H. Wilkins, Dublin and King's Coll.; Gwendolen Wilson, Aberdeen and Univ. Coll.; and J. G. Wilson, King's Coll.

Diploma in Laryngology and Otology.—W. R. Beavis, Birmingham Ear and Throat Hosp.; J. B. Cavenagh, Oxford and St. Thomas's; J. Hare, Durham and Roy. Army Med. Coll.; H. I. Marriner, St. Thomas's; and T. G. Wynne, Melbourne and Central London Throat and Nose Hosp.

Diploma in Psychological Medicine.—J. S. Harris, Edinburgh and Hanwell; W. J. T. Kimber, St. Thomas's and Hill End; N. Macleod, Edinburgh, Leeds, and York; E. G. T. Poynder, Middlesex and Epsom; and D. Slight, Edinburgh.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following candidates passed the terminal examination of the seventy-fifth session of the School (April to July, 1924) with distinction:—

A. W. Grace (winner of "Lalcaca" and "Duncan" medals), B. B. Yodh, W. Rae, T. Creaser, R. B. Wallace, G. C. Ramsay, and R. Dick.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

FINAL M.B. AND CH.B. EXAMINATION.

Margaret A. Bromhall, W. C. V. Brothwood, T. A. Brown, *J. A. Crowther, Madge E. Edwards, Reginald Ellis, A. G. Forbes, Philip Gregory, Edward Holmes, †Winifred L. Horton, W. G. Howson, *Phyllis I. Kaufmann, David Kemp, *‡Hilda M. Linford, F. R. Lockhart, Gladys F. A. McLean, Alice M. Orrell, Thomas Peirson, Samuel Pope, L. J. Prosser, Albert Riley, W. M. Roberts, Eileen Sheehan, Dorothy Simmons, John Sims, G. S. Smith, James Troup, H. M. Turner, C. L. Walker, Eric Whiteside, †Charles Wilcocks, and Geoffrey Williamson.

* Second-class honours. † Distinction in Medicine.
‡ Distinction in Forensic Medicine.

Obstetrics and Surgery.—A. R. Addey-Redfern, J. K. Barr, C. V. Brown, Stella H. Brown, Elsie Catlow, William Chadwick, S. F. Clegg, Jenny D. Craig, Stanley Devine, Florence M. Duckworth, Charles Eccleston, J. D. Farquhar, R. A. Ferguson, James Haslam, G. H. Hayle, §A. H. Heyworth, Elizabeth G. Humble, A. M. MacGill, William Mottershead, Ethel Morris, Henry Penman, T. W. Rothwell, H. T. Simmons, A. B. Slack, Robert Slater, H. C. Smith, Ronald Walshaw, S. E. Ward, Samuel Whalley, R. M. Williams, S. P. Wilson, K. K. Wood, P. B. Wood, and Frank Yates.

§ Distinction in Obstetrics.

Forensic Medicine and Hygiene and Preventive Medicine.—R. S. Adam, William Chadwick, T. E. Davies, C. R. Fielding, A. H. Heyworth, J. N. Hudson, T. W. Rothwell, R. F. Stubbs, and J. M. Yoffey.

Forensic Medicine.—Solomon Bernstein, J. W. Graham, Robert Slater, and A. R. Somerford.

Obstetrics.—C. T. Marshall, Joseph Shlosberg, E. J. Warburton, and J. M. Yoffey.

Surgery.—P. G. Johnson and R. F. Stubbs.

Medicine.—J. M. Yoffey.

Hygiene and Preventive Medicine.—Anne H. Glancy and E. J. Warburton.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Part II.—L. C. F. Chevens, H. D. Cormac, T. W. Davidson, W. J. Lynch, and W. R. McGlashen.

DIPLOMA IN PUBLIC HEALTH.

Part II.—F. R. Ferguson Marjorie A. Grant, Gladys J. C. Russell, Enid F. Stowell, and Ethel White.

The Vice-Chancellor, in his annual report for the session 1923–24, states that the number of students in the Faculty of Medicine was 686, of whom 128 were women. The following comparative statement shows the total number of students in the Faculty of Medicine: 353 (1917–18), 538 (1918–19), 771 (1919–20), 754 (1920–21), 734 (1921–22), 711 (1922–23), 686 (1923–24). Amongst the donations to the medical faculty were £200 from Prof. A. V. Hill, F.R.S., for the establishment of a prize in biochemistry, and £2028 from the trustee of the late Mrs. Morrison Watson for the foundation of an exhibition or scholarship in anatomy in memory of her husband, who was for many years professor of anatomy in Owens College and the University. In October, 1923, the new curriculum was inaugurated according to the recommendation of the General Medical Council, which entails six years' work in the medical school for the degree course. A student will not be registered by the General Medical Council as a medical student until he has passed the science examination in chemistry and physics. The longer period of studentship did not reduce the entries below the normal in number, as 53 students were registered for the first year of the degree course in October. A course for the Diploma in Psychological Medicine, instituted before the war, was given this session and was attended by six qualified men. New regulations for the Diploma in Public it has been necessary to pass them under review, and where it has been found that the rate paid is in excess of the local rate for similar work or of the rates paid in other comparable institutions, a small reduction has been made. The staff affected is under 20 per cent. of the total number whose wages have been reconsidered. I am sending the hon. Member a comparative statement of the old and the new rates.

THURSDAY, JULY 10TH.

Incurable Tuberculosis Patients at Maidstone.

Major **WILLIAMS** asked the Minister of Pensions if, by legislative or administrative action, he could place on a permanent and more satisfactory basis the pensions of men suffering from incurable tuberculosis in Preston Hall, near Maidstone.—Mr. F. O. **ROBERTS** replied: The men suffering from tuberculosis who are inmates of Preston Hall are in that institution either for periods of treatment or for treatment combined with a course of training. Such cases are not, therefore, in a condition in which a final award could properly be determined in the interests of the men themselves.

Pensioners and Final Awards.

Mr. **AYLES** asked the Minister of Pensions whether, in view of the general dissatisfaction existing in regard to the system of making final awards to pensioners whose disabilities were assessed at less than 20 per cent., he would take steps to abolish this system at an early date.—Mr. F. O. **ROBERTS** replied: I am not at present convinced that the course suggested, which would involve amendment of the Act, is called for. Cases of the class referred to, like those of any other class, in which it is shown that the last award was erroneously declared final, will, it is anticipated, be met by the arrangements which have recently been introduced to deal with cases of serious error. I am carefully watching the operation of these arrangements. I may perhaps remind my hon. friend that cases of minor disablement have never, under the Pensions Warrants, been entitled to a continuing pension, and their position in this respect has not been affected by the final award.

Accommodation at Roehampton Hospital.

Mr. **BECKER** asked the Minister of Pensions if he could make inquiries into the accommodation at the Roehampton Hospital; and could steps be taken to speed up the fitting of artificial legs so that ex-Service men did not lose their day's work.—Mr. F. O. **ROBERTS** replied: The accommodation at Roehampton Hospital is ample, and I do not think that any avoidable delay occurs in fitting or repairing artificial legs. Moreover, every pensioner has been supplied with a duplicate leg, to be used while the first is under repair and the necessity for personal attendance at the hospital is thus, for the most part, avoided after a first fitment.

Small-pox Deaths in 1923.

Mr. **BROMFIELD** asked the Minister of Health what were the ages of the persons registered as having died from small-pox in the year 1923, and in what towns or villages they occurred.—Mr. **WHEATLEY** replied: The particulars of the deaths from small-pox in England and Wales during 1923 are as follows:—

Age of deceased.	Deceased's place of—	
	Death.	Residence.
1 month.	Small-pox hospital. Brockworth, Gloucester.	Gloucester.
10 months.	,,	,,
5 years.	,,	,,
63 ,,	,,	,,
28 ,,	Joyce Green Hospital. Dartford.	Neasden, Willesden.
55 ,,	,,	Battersea.
17 ,,	Chester.	Chester.

MONDAY, JULY 14TH.

A Medical Staff and Trade-Unionism.

Mr. **EDMUND HARVEY** asked the Minister of Health whether his attention had been called to the action of the guardians of the West Ham Union in informing the officers in their service, including the whole-time medical staff. matron, nurses, and indentured probationer nurses of the Whipps Cross Hospital, that they desired them to become members of a trade-union affiliated to the Trade Union Congress, and to the decision of the board of guardians to review the position with reference to existing officers at the expiration of two months from the adoption by the board of this recommendation; whether he has had any communication with the board as to their action in this matter; and, whether, in view of the special difficulties that the action of the guardians had caused to the medical and nursing staff, he would take steps to prevent the imposition of such a regulation by the board of guardians.—Mr. **GREENWOOD** replied: My right hon. friend is aware of the action of the guardians though he has not been in direct communication with them. The guardians do not appear to be exceeding their legal powers, and my right hon. friend does not see that the matter is one in which he could usefully take any action.

Purchases of Dangerous Drugs in Britain.

Captain **WEDGWOOD BENN** asked the Home Secretary how much opium was purchased by factories in Great Britain in 1923; how much morphia, how much heroin, and how much codeine was manufactured by the factories; and how much of each of these narcotics was sent abroad. —Mr. **HENDERSON** replied: I assume that by "factories" the hon. and gallant Member means only those firms which are licensed under the Dangerous Drugs Acts to manufacture morphine and heroin and their salts. The amount of opium imported and purchased by those firms in 1923 was 125,833 lb. The amount of morphine and its salts manufactured in 1923 was 254,337 oz., of which, however, 166,397 oz. were converted into heroin, codeine, or other derivatives of opium, leaving a net total of 87,940 oz., of which 78,611 oz. were exported. The amount of heroin manufactured in 1923 was 11,575 oz., and the total exports of heroin amounted to 12,011 oz. The amount of codeine manufactured in 1923 was 162,036 oz., of which 160,910 oz. were exported by the manufacturers. As codeine is not subject to the Dangerous Drugs Acts, its movements are not recorded after it leaves the manufacturers, and it is not therefore known whether any other amounts of codeine were exported during 1923 by persons other than the manufacturers.

The Services.

ROYAL ARMY MEDICAL CORPS.

ARMY RESERVE OF OFFICERS.

Army Dental Corps: Lt. P. Colk, from Green Howards, Res. of Off., to be Lt.

TERRITORIAL ARMY.

Maj. J. W. Craven to be Lt.-Col. and to Comd. 149th (Northern) Field Ambulance, vice Lt.-Col. F. Hawthorn vacated on completion of tenure of comd.

Lt. H. M. Brown to be Capt.

ROYAL AIR FORCE.

H. W. Corner is granted a short service commission as a Flying Officer.

Flight Lt. T. A. G. Hudson is transferred to the Reserve, Class D.2.

Flying Officer K. R. Smith relinquishes his temporary commission on ceasing to be employed.

SIR MALCOLM MORRIS MEMORIAL FUND.

Dr. Howard Mummery, the hon. secretary of the Committee, sends the following supplementary list of subscribers to this Fund. The total to date is £409 8s. 2*d*.

Dr. George C. Andrews and Mrs. Angell.
Sir Anthony A. Bowlby and Dr. Walter Broadbent.
Sir Felix Cassel and Sir Francis H. Champneys.
Dr. Mary Douie and Sir Dyce Duckworth.
Lady Emmott.
Mr. Walter Farris, Dr. Wilfrid S. Fox, and Mr. H. W. Fraser.
Mrs. James Gow, Hon. Walter Guinness, M.P.
Dr. C. O. Hawthorne and Mr. Edward M. House.
Mr. Warwick James and Mr. and Mrs. L. Jopling.
Mr. Richard Lluellyn.
Dr. G. M. MacKee, Dr. Henry E. Michelson, Dr. R. Pryce Mitchell, Lady Morris, Miss C. Morris, Miss G. Morris, Mr. Harold S. Morris, K.C., and Miss Hilda Morris.
National Council for Combating Venereal Diseases, N.C.C.V.D., Hull Branch, and N.C.C.V.D., Plymouth Branch.
Mr. A. E. Hayward Pinch and Mr. W. A. Posnett.
Mr. and Mrs. John Rivers and Sir Leonard Rogers.
Mr. Henry S. Saint, Dr. Henry Semon, and Mr. C. F. Sutcliffe.
Captain Oskar Teichman.
Miss Edith Wethered and Mr. A. Hamilton Wood.

Further subscriptions will be gratefully acknowledged if forwarded to the hon. treasurers, Sir Malcolm Morris Memorial Fund, at 12, Stratford-place, London, W. 1.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council of the College Sir John Bland-Sutton was re-elected President and Mr. H. J. Waring re-elected and Mr. Walter G. Spencer elected Vice-Presidents for the ensuing year. Mr. W. McAdam Eccles, Mr. Wilfred Trotter, and Sir Charles Gordon-Watson, having been duly elected at the meeting of Fellows on July 3rd, were introduced and took their seats as members of the Council. Mr. Donald Kennedy Cassels, B.A. Camb., was appointed Assistant to the Secretary during the ensuing year. Mr. R. H. Burne was re-elected Pathological Curator and Sir Frank Colyer was re-elected Hon. Curator of the Odontological Collection. Mr. Cecil F. Beadles was reappointed Assistant Pathological Curator and Mr Clement E. Shattock was reappointed Pathological Assistant in the Museum for the ensuing year.—On the advice of the Museum Committee the office of Pathological Curator of the Museum was left vacant for the present. Mr. T. W. P. Lawrence, F.R.C.S., was invited to advise and assist in rearranging and revising the series of special pathology in the Museum.—It was announced that the Library of the College would be closed in August as well as in September for the purpose of cleaning and re-decorating.—A letter of July 3rd was read from the Chairman of the Lister Memorial Committee reporting that thr Lister Medal for distinguished contributions to surgical science had been awarded to Sir W. Watson Cheyne, Bart., and that, in compliance with the conditions of the Trust, Sir Watson Cheyne had undertaken to give an address at the Royal College of Surgeons on some date in 1925 convenient to the President and Council.

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Arnott Demonstrator.—Sir Arthur Keith: Six demonstrations on the Contents of the Museum.

Licences to practise dentistry were conferred upon the following 63 candidates, who have passed the requisite examinations and have complied with the by-laws:—

L. P. Allen, London; L. N. Alley, Manchester; P. R. Asplet, Manchester and Royal Dental; J. Badenhorst, Royal Dental; E. A. Balkwill, Birmingham; W. J. Barnard, Guy's; D. C. Blyth, Royal Dental; W. R. Booth, London; W. L. Breese, Royal Dental; D. F. G. Came, Middlesex; H. Cantor and P. L. Carnall, London; S. D. Cloete, Royal Dental; A. Critchley, Manchester; E. J. B. Curtis, Guy's; J. M. Davies, Univ. Coll.; A. E. Davis and C. E. Day, Royal Dental; R. S. De Bruyn, Guy's; M. B. Deverell and A. Dreaper, Royal Dental; P. J. Du Toit and E. F. Farmer, Guy's; A. Fleming, Durham; C. H. Fox and W. H. Foy, Guy's; P. D. Gausden, London; E. F. Gibson, Guy's; Sarah Glasstone, Univ. Coll.; F. H. Goddard, Guy's; J. F. Godfrey, Birmingham; H. E. Hovell and V. W. Humpherson, Royal Dental; K. Huxtable, Bristol; N. H. Jenkins, Royal Dental; A. F. King, Guy's; F. W. Lambert and A. P. McClare, London; M. Marais, Royal Dental; P. M. Margand, Univ. Coll.; J. W. Mitchell, London; F. E. Padgett and L. Page, Royal Dental; Marjorie E. C. Page, Univ. Coll.; N. Parkinson and K. F. Pelley, Guy's; H. L. Pretty, London; P. Rosen, Royal Dental; J. C. Rowbotham, Guy's; C. G. Searle, Univ. Coll.; W. H. Shapland, London; Ita N. Shatz, Royal Dental; N. H. Simmonds, Bristol; M. Sperber, S. G. A. Stephenson, and B. J. Swyer, London; J. H. Threlfall, Univ. Coll.; G. G. T. Tregarthen, Guy's; W. A. Turner, Royal Dental; H. P. R. Williams, Guy's; R. N. Winnett, London; R. Woodcock, Sheffield; and B. Woolich, London.

The undermentioned diplomas were conferred (in conjunction with the Royal College of Physicians of London):—

Diploma in Public Health.—H. L. Barker and Joyce R. Batten, Univ. Coll.; W. G. Booth, King's Coll.; L. P. Costobadie, Cambridge and Manchester; A. Crawford, Glasgow and Roy. Inst. Public Health; R. B. Dalal, Bombay and Univ. Coll.; Edith M. P. Davies, Royal Free and King's Coll.; S. R. E. Davies, Cambridge and St. Bart.'s; Helen M. Du Buisson, King's Coll.; Mary Esslemont, Aberdeen and King's Coll.; Gwladys Evans, Univ. Coll.; Dorothy J. L. Gallie, Glasgow and Univ. Coll.; P. C. C. Garnham, St. Bart.'s; G. M. Hargreaves, Edinburgh and Univ. Coll.; Marjorie C. Hawkins, Roy. Inst. Public Health; N. R. Jenkins, Cardiff and Roy. Inst. Public Health; Elspeth H. R. Livingstone, Edinburgh and Univ. Coll.; V. A. Luna, Guy's and Univ. Coll.; Kathleen F. Matthews, Univ. Coll.; Alice D. Pocock, Royal Free and Univ. Coll.; A. T. W. Powell, Guy's; I. N. O. Price, Univ. Coll.; Violet Reade, Royal Free and King's Coll.; Grace Stevenson, Otago and Univ. Coll.; Emma M. Store, Royal Free and Univ. Coll.; E. Tagoe, Cambridge and Univ. Coll.; Blanchette Thomas, Univ. Coll.; P. Thwaites, St. Bart.'s; E. H. Wilkins, Dublin and King's Coll.; Gwendolen Wilson, Aberdeen and Univ. Coll.; and J. G. Wilson, King's Coll.

Diploma in Laryngology and Otology.—W. R. Beavis, Birmingham Ear and Throat Hosp.; J. B. Cavenagh, Oxford and St. Thomas's; J. Hare, Durham and Roy. Army Med. Coll.; H. I. Marriner, St. Thomas's; and T. G. Wynne, Melbourne and Central London Throat and Nose Hosp.

Diploma in Psychological Medicine.—J. S. Harris, Edinburgh and Hanwell; W. J. T. Kimber, St. Thomas's and Hill End; N. Macleod, Edinburgh, Leeds, and York; E. G. T. Poynder, Middlesex and Epsom; and D. Slight, Edinburgh.

LONDON SCHOOL OF TROPICAL MEDICINE.—The following candidates passed the terminal examination of the seventy-fifth session of the School (April to July, 1924) with distinction:—

A. W. Grace (winner of "Lalcaca" and "Duncan" medals), B. B. Yodh, W. Rae, T. Creaser, R. B. Wallace, G. C. Ramsay, and R. Dick.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful in the subjects indicated:—

FINAL M.B. AND CH.B. EXAMINATION.

Margaret A. Bromhall, W. C. V. Brothwood, T. A. Brown, *J. A. Crowther, Madge E. Edwards, Reginald Ellis, A. G. Forbes, Philip Gregory, Edward Holmes, †Winifred L. Horton, W. G. Howson, *Phyllis I. Kaufmann, David Kemp, *‡Hilda M. Linford, F. R. Lockhart, Gladys F. A. McLean, Alice M. Orrell, Thomas Peirson, Samuel Pope, L. J. Prosser, Albert Riley, W. M. Roberts, Eileen Sheehan, Dorothy Simmons, John Sims, G. S. Smith, James Troup, H. M. Turner, C. L. Walker, Eric Whiteside, †Charles Wilcocks, and Geoffrey Williamson.

* Second-class honours. † Distinction in Medicine.
‡ Distinction in Forensic Medicine.

Obstetrics and Surgery.—A. R. Addey-Redfern, J. K. Barr, C. V. Brown, Stella H. Brown, Elsie Catlow, William Chadwick, S. F. Clegg, Jenny D. Craig, Stanley Devine, Florence M. Duckworth, Charles Eccleston, J. D. Farquhar, R. A. Ferguson, James Haslam, G. H. Hayle, §A. H. Heyworth, Elizabeth G. Humble, A. M. MacGill, William Mottershead, Ethel Morris, Henry Penman, T. W. Rothwell, H. T. Simmons, A. B. Slack, Robert Slater, H. C. Smith, Ronald Walshaw, S. E. Ward, Samuel Whalley, R. M. Williams, S. P. Wilson, K. K. Wood, P. B. Wood, and Frank Yates.

§ Distinction in Obstetrics.

Forensic Medicine and Hygiene and Preventive Medicine.—R. S. Adam, William Chadwick, T. E. Davies, C. R. Fielding, A. H. Heyworth, J. N. Hudson, T. W. Rothwell, R. F. Stubbs, and J. M. Yoffey.

Forensic Medicine.—Solomon Bernstein, J. W. Graham, Robert Slater, and A. R. Somerford.

Obstetrics.—C. T. Marshall, Joseph Shlosberg, E. J. Warburton, and J. M. Yoffey.

Surgery.—P. G. Johnson and R. F. Stubbs.

Medicine.—J. M. Yoffey.

Hygiene and Preventive Medicine.—Anne H. Glancy and E. J. Warburton.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Part II.—L. C. F. Chevens, H. D. Cormac, T. W. Davidson, W. J. Lynch, and W. R. McGlashen.

DIPLOMA IN PUBLIC HEALTH.

Part II.—F. R. Ferguson Marjorie A. Grant, Gladys J. C. Russell, Enid F. Stowell, and Ethel White.

The Vice-Chancellor, in his annual report for the session 1923–24, states that the number of students in the Faculty of Medicine was 686, of whom 128 were women. The following comparative statement shows the total number of students in the Faculty of Medicine: 353 (1917–18), 538 (1918–19), 771 (1919–20), 754 (1920–21), 734 (1921–22), 711 (1922–23), 686 (1923–24). Amongst the donations to the medical faculty were £200 from Prof. A. V. Hill, F.R.S., for the establishment of a prize in biochemistry, and £2028 from the trustee of the late Mrs. Morrison Watson for the foundation of an exhibition or scholarship in anatomy in memory of her husband, who was for many years professor of anatomy in Owens College and the University. In October, 1923, the new curriculum was inaugurated according to the recommendation of the General Medical Council, which entails six years' work in the medical school for the degree course. A student will not be registered by the General Medical Council as a medical student until he has passed the science examination in chemistry and physics. The longer period of studentship did not reduce the entries below the normal in number, as 53 students were registered for the first year of the degree course in October. A course for the Diploma in Psychological Medicine, instituted before the war, was given this session and was attended by six qualified men. New regulations for the Diploma in Public

Health, to meet the requirements set out by the General Medical Council, are now in force and the first course under the new regulations will commence in October next.

University of Aberdeen.—At the graduation ceremonial on July 10th degrees were conferred in the Faculty of Medicine on the following successful candidates :—

Doctor of Medicine.

*William Corner, *Robert J. Duthie, *Robert Forgan, *William I. Gerrard, Alastair R. Grant, Norman M. Maclennan, James Rannie, Robert Rannie, Henry J. Thomson, and Ian S. Thomson.

* Awarded commendation for thesis.

Master of Surgery.

Robert D. Lockhart and Foster H. B. Norrie.

Bachelor of Medicine and Bachelor of Surgery.

With First-class Honours.—*Anthony M. Hendry.

With Second-class Honours.—†Edward C. Chitty, †Richard B. Henderson, †John Innes, and †David West.

Ordinary Degree.—Redvers Anderson, John H. Arthur, Alexandra H. Benton. Kathleen Booth, Forbes Buchan, Andrew S. Burns, William Chisholm, Annie S. Clark, Mary Coutts, Edith Cran, Eirene V. Croll, James Crombie, John G. Currid, Francis R. Daniel, David Duncan, John C. Forbes, Stanley Forrest, Roderick M. Fraser, Ethel L. R. Galloway, Alexander D. Garden, †William C. Gorrod, James Hutcheon, Penuel M. Innes, Colin Joiner, Dudley W. Kirk, Flora H. G. Macdonald, John Macdonald, Thomas J. C. Macdonald, Robert H. Mackay, Roderick Mackay, Roderick Mackay, Alexander L. McLeod, Duncan Macleod, Christine Macrae, Charles P. Murray, Peter W. Philip, Alexander Reid, Alexander Reid, William M. Ritchie, Alexander Rose, †Cyril J. Sandford, William N. Simpson, James M. Smith, Alexander Stalker, Norman Taggart, George J. M. Teunon, William G. Watson, and Herbert M. Wright.

* Completed Final Examination with much distinction.
† Completed Final Examination with distinction.

Diploma in Public Health.

Catherine J. Clark, Eleanor M. Henderson, Charlotte S. Hendry, Roberta McLeish, Bethia M. Newlands, Violet M. G. Smith, John S. Taylor, and Gladys M. L. West.

The degree of honorary Doctor of Laws was conferred on Michael Comport Grabham, M.D., for unremitting services in scientific research.

Royal Faculty of Physicians and Surgeons of Glasgow.—At the monthly meeting of the Faculty held on July 7th William Kirkpatrick Anderson, M.B., Ch.B., (Glasgow), and Joseph Thomas Herbert Madill, M.B., Ch.B. (Chester), were admitted (after examination) as Fellows of the Faculty.

London (R.F.H.) School of Medicine for Women.—Research Fellowships, in connexion with the obstetrical and gynæcological unit, have been awarded to Miss Olive Rendel, M.D., B.S., and Miss Alfreda Baker, M.B., Ch.B. The donor of the funds for the Fellowships has also presented an electrocardiograph to the Royal Free Hospital. A "1916" bursary of the value of £50 a year for five years will be awarded to a student who has matriculated and who wishes to enter the school in October, 1924, to begin a full course of study for a medical degree. Full particulars can be obtained on application to the Warden and Secretary, 8, Hunter-street, London, W.C. 1. The Woman's Enquiry Bureau, No. 1, Quality-street, British Empire Exhibition, furnishes full particulars concerning the course of medical study at the school.

Study of Malaria in Eastern Europe.—The League of Nations Commission for the study of the incidence of malaria in Eastern Europe reached Moscow on July 13th in the course of its three months' tour. The Commission began its investigations in Jugoslavia at the end of May last, and has since visited Macedonia, Bulgaria, Roumania, and Poland. In Russia and the Ukraine the Commission is to study the principal malaria regions—namely, the Ukraine (Kharkov, Bakhmut and environs); Northern Caucasus (Rostov, Piatigorsk and neighbouring health resorts); the Volga region (Tsaritsyn, from Tsaritsyn to Nishni-Novgorod by boat along the Volga, Saratov Pokrovsk, the German Volga Republic; Kazan and the Tartar Republic). From Nishni-Novgorod the Commission will return to Moscow, where it will be shown the working of the Central Health Organisation and particularly the anti-malarial work of the Russian Health Service, and will take part in a conference on malaria. Leaving Russia on August 4th, the Commission will proceed to Italy to inspect the areas infected by malaria and to draw up a report on the results of the voyage. Throughout the journey the central health authorities of the countries visited have conducted the party and shown it both the actual conditions in the areas infected with malaria and the measures taken to instruct and organise the health service for combating this disease. The Commission will, therefore, be in a position to make an exhaustive report on the whole question of malaria in Southern and Eastern Europe. Prof. Nocht, Director of the Institute for Tropical Diseases in Hamburg, heads the Commission as vice-chairman, Great Britain, France, Italy, Spain, Roumania, Jugoslavia, and Russia also being represented.

University of London.—The Sharpey physiological scholarship, founded in memory of Prof. William Sharpey, will shortly be filled, on the recommendation of the Faculty of Medical Sciences of University College, London. The value of the scholarship is £160 a year. The scholar is provided with full opportunities for advancing the study of physiology and of undertaking research. He takes a small share in teaching and demonstrating to students. Applications, containing a full statement of candidates' educational record, including a list of publications, if any, should be sent to the secretary of University College, London (Gower-street, London, W.C. 1), not later than Saturday, July 26th.

Visit of American Medical Men to Great Britain.—Some 300 members of the Inter-State Post-Graduate Assembly will visit this country next year from June 1st to June 20th, and will be entertained at Liverpool, Leeds, Newcastle, Manchester, Glasgow, Belfast, and Dublin. and possibly at other places. During the visit the annual Congress of the Tri-State Medical Associations will be held under the presidency of Dr. W. J. Mayo, and the Royal Society of Medicine has placed at the disposal of the Congress some of its lecture rooms. There will be demonstrations at several of the large London hospitals. The visit will terminate by a trip to Paris. Local arrangements are in the hands of Sir Robert Jones, Sir Berkeley Moynihan. Sir William Milligan, Sir Harold Stiles, Sir William de Courcy Wheeler, Mr. Grey Turner, and Prof. Tuffier, of Paris, while the advisory committee in London will consist of Sir Humphry Rolleston, Sir William Hale-White, Sir StClair Thomson, Mr. H. J. Waring, and Mr. Philip Franklin, who is acting as the hon. secretary.

Royal Ear Hospital.—Mr. Geoffrey E. Duveen, chairman of the Royal Ear Hospital, Dean-street, Soho, London, W., announces that negotiations have now been completed for the purchase of a site on which to rebuild the hospital. This site is situated on the corner of Huntley-street and Pancras-street, Bloomsbury, W.C., and is adjacent to University College Hospital and the new Rockefeller buildings. The chairman, himself a victim of deafness, made it possible to commence this scheme by a gift of £15,000 to the hospital. The gift is a memorial to his father, the late Mr. Henry J. Duveen. The work of clearing the site and building the new hospital will be put in hand as soon as possible.

The late Dr. W. A. Evans.—The death occurred suddenly on July 7th of Dr. William Arnold Evans, of Oakworth, near Keithley, Yorks. Dr. Evans was found in a state of collapse in his surgery and died before medical aid could reach him. Dr. Evans qualified in 1883 as M.R.C.S. and L.S.A. In 1888 he took the M.D. of London University, in 1890 D.P.H. Camb., and B.Sc. Vict. in 1904. Before settling in practice in Bradford, he was for a time house physician in the Wolverhampton General Hospital, house physician at the Manchester Royal Infirmary, and resident at Monsall Fever Hospital. He was appointed medical officer of health for Bradford in 1891 and resigned this office in 1913, when he took up practice in Oakworth.

Star and Garter Home.—The King and Queen visited the Star and Garter Home for Disabled Sailors and Soldiers, Richmond, on July 10th, and were received by the Mayor of Richmond and others representing the borough. Lord Grenfell (the President), Sir Arthur Stanley and Sir William Bennett (chairman and vice-chairman of the governors), Lady Cowdray, Dame May Whitty, and Sir Edwin Cooper, the hon. architect, conducted their Majesties to the reception room, where Sir Arthur Stanley described the origin of the Star and Garter scheme, and expressed the thanks of the governors to the donors who had helped to build and endow the home, specially mentioning Sir Edwin Cooper, who had given his services free of charge. Dame May Whitty, chairman of the British Women's Hospital Committee, outlined the activities of that Committee in raising money for the building of the home from British women at home and abroad. The Queen received the deeds of the building from Lady Cowdray, the hon. treasurer of the British Women's Hospital Committee, and accepted a handsome album from Sir Edwin Cooper. A short religious ceremony was held, after which a number of presentations were made to their Majesties. including members of the British Red Cross Society and the Order of St. John of Jerusalem, and the following members of the hon. medical staff of the Star and Garter: Sir David Ferrier (consulting physician), Mr. Percy Sargent (consulting surgeon), and Mr. John Matthews (consulting bacteriologist). The King and Queen then made an extensive tour of the building, and spoke to some of the disabled soldiers before taking their departure.

Douglas, Isle of Man.—On July 8th the Manx legislature passed a vote for £20,000 from revenue to build a maternity ward for the island at Douglas Hospital. The cost of maintenance will be borne by the hospital committee.

North-East London Post-Graduate College.—An intensive course at the Prince of Wales's General Hospital will begin on July 21st and will last for 14 days. It will include lectures and demonstrations of clinical methods and cases, and work in the general wards and special departments of the hospital. Those proposing to take the course should send in their names to the Secretary of the Fellowship of Medicine, 1, Wimpole-street, W. 1, not later, if possible, than to-day, Friday, July 18th.

Manchester's Babies' Hospital.—In the view of the Public Health Committee this hospital is doing very good work, and a certain number of its beds are subsidised by the corporation and ear-marked for cases treated under the corporation's maternity and child welfare scheme. New wards to accommodate 80 patients are to be erected, and the Ministry of Health has already promised the grant of £6000, which will cover about one-half of the estimated cost of the new building. The corporation proposes to borrow £6000 and lend it to the board of management of the hospital. The board hopes to obtain £6000 by public subscription.

Bristol Medical Students' Visit to Bath.—A large party of medical students from Bristol University visited the bathing establishment on July 11th, under the auspices of Dr. J. Odery Symes, to extend their knowledge of medical hydrology and study its practical application as carried out by means of the exceptionally complete installation at the hot mineral baths of Bath. They were received by Mr. John Hatton, the director of the baths, and after going over the establishment and seeing various demonstrations, heard a lecture from Dr. Vincent Coates on the types of diseases chiefly treated at Bath. After tea the party visited the Roman baths.

The late Dr. J. H. Mawson.—On the night of July 10th Dr. James Hargreave Mawson, L.R.C.P. & S. Edin., of Leeds, sustained a fatal injury while riding his motorcycle. He was conveyed to the Leeds Infirmary where he died shortly after admission. Dr. Mawson graduated in 1882 and had an extensive practice in the city and was a well-known member of the Leeds Medical Panel Committee under the Health Insurance Acts. He was of a retiring disposition and took little part in active public life, but he was held in high esteem by his fellow practitioners and was regarded as a valued and most useful member of the panel committee.

Spanish Doctors in London.—A party of medical men from Spain arrived on July 17th on a visit to London, and have been accommodated at the Hotel Bedford, Southampton-row, W.C. They include Prof. Rafael Pizá, Prof. Ricardo Moragas, Dr. Domingo Duran Arrom, Dr. José Ma. Rosell, Dr. Luis de March, Dr. Juan San Ricart, Dr. Luis Vila Avadal, Dr. Francisco Humedas, Dr. Juan Sana, Prof. Domingo Carles, Mr. Arturo Claveria, Dr. Manuel Casanovas Camps, Mr. Pedro Casa Abarca, Dr. Pla y Armengol, Mr. Augustin Mestre. During the course of their visit lectures will be delivered in French by Dr. José Ma. Rosell on the Problem of the Intestinal Fermentations and Putrefactions, and by Dr. Pla y Armengol on the Bacteria of Tuberculosis; Dr. Armengol will also lecture in English on the Clinical Idea of Tuberculosis. As we go to press the date and place of these lectures are not settled.

Medicated Water.—At the Conference of the British Waterworks Association held recently, Sir Alexander Houston, director of water examination to the Metropolitan Water Board, read a paper on Purification of Water-supplies. Sheffield, he said, was the first place to adopt the lime treatment of moorland water, in order to correct the acidity, harden the water, and prevent its solvent action on lead. The use of rain-water for drinking purposes should be encouraged. At the present time, he said, a remarkable physiological experiment on a large scale was being carried out at Rochester, United States, which had given rise to the Derbyshire suggestion of medicating the water-supplies at Chesterfield for the purpose of arresting goitre or "Derbyshire neck." Small doses of a salt of iodine were being artificially added to the water-supply bi-annually for two or three weeks at a time with the object of preventing thyroidism. Although it was contrary to ordinary medical teaching to force a whole population to drink treated water for the benefit of the minority, Switzerland had shown some precedent for the experiment. A majority of persons would probably consider that these matters were best left in the hands of family doctors or medical officers of schools, and that it was outside the province of a waterworks authority to administer preventive drugs wholesale even in harmless doses.

The Oxford Press Library.—The library at the new home of the Oxford University Press in Warwick-square, London, E.C., is now open, and all interested in books are at liberty to inspect therein at their leisure any of the volumes, which number some 10,000. There is a librarian in charge, who is ready to supply information or give advice.

Donations and Bequests.—Among other legacies received during the past three weeks by the Edinburgh Royal Infirmary is one by Miss Jessie Aitken of Glenbervie, Larbert—sum to account of residue—£20,000 (permanent capital).—Sir Mortimer Singer has sent a cheque for £1000 to the Mayor of Torbay as a contribution to the Mayor's appeal for £80,000.—Among recent gifts to the British Red Cross Society for the British Empire Cancer Campaign is one of £3000 from an anonymous donor. The Staffordshire branch of the British Red Cross Society has sent £567, the Cheshire branch £240, and the Essex branch £204.—Dr. John Mallet Purser has offered to the Board of Trinity College, Dublin, where he is Regius Professor of Physics, £10,000 for the benefit of the school of physic and the schools of experimental and natural science.—The late Mr. John George Kincaid, of Greenock, left by will £1000 to the Greenock Royal Infirmary; £500 to the Greenock Eye Infirmary; and £500 to the Grenock District Nursing Association.—Under the will of the late Sir John Stewart Clark, Bart., the testator left £1000 to the Annie Clark Fund for Incurables, Paisley; £1000 to the Royal Alexandra Infirmary, Paisley; £1000 to the Royal Infirmary, Edinburgh; £500 to the Royal Victoria Eye Infirmary, Paisley; £500 to the Paisley Convalescent Home, West Kilbride; £500 to the Royal Edinburgh Hospital for Sick Children; and £500 to the Queen Victoria Jubilee Institute for Nurses, Edinburgh.—Mr. James Manfield, J.P., the head of Manfield and Sons, Limited, boot manufacturers, of Northampton, has given Weston Favell House, which he built about 25 years ago at a cost of over £100,000, to the Northampton Crippled Children's Fund for an orthopædic hospital. The house contains 23 bedrooms.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, July 21st, to Saturday, July 26th.—Prince of Wales's General Hospital, Tottenham. Special Intensive Course in Medicine and Surgery (first week). —Royal Eye Hospital, Southwark, S.E. Mon., 10.30 A.M., Mr. A. D. Griffith: Operations. Tues., 3 P.M., Mr. L. V. Cargill: Lecture-Dem. on Operations. 5 P.M., Dr. J. Collier: Ocular Paralyses. Wed., 3 P.M., Clinical Cases. 5 P.M., Mr. A. D. Griffith: Cataract. Thurs., 3 P.M., Clinical Cases. 5 P.M., Mr. W. J. Lindsay: Eye Complications in Acute Fevers. Fri., 3 P.M., Clinical Cases. 5 P.M., Mr. E. A. Dorrell: The Pupil in Diseases of the Eye.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, July 21st.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. Simson: Diseases of Women.

Tuesday.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Wednesday.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients.

Thursday.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Medical Registrar: Clinical Methods. 2 P.M., Surgical Registrar: Surgical Out-patients.

Friday.—10 A.M., Mr. Dudley Buxton: Dental Dept. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

Saturday.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

Brunton, C. E., M.B. Camb., M.R.C.S., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Lyndhurst District of the County of Southampton.

Clark, G. A., M.D. Durh., Lectureship in Physiology at the University of Sheffield.

Dunscombe, Clement, M.B., B.Ch. Camb., D.P.H., Assistant County Medical Officer of Health and Assistant School Medical Inspector for Wiltshire.

Elvins, R. S., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., Police Surgeon at Scarborough.

Fagan, R. F., M.B., B.S., D.P.H., Pathologist to St. John's Hospital for Diseases of the Skin.

McAlpine, Douglas, M.B., Ch.B. Glasg., M.R.C.P. Lond., Physician to the Department for Nervous Diseases at the Middlesex Hospital.

Scott, Evelyn M., M.B., B.S. Durh., Junior Resident Medical Officer, Royal Infirmary, Sunderland, to act as House Physician at the Children's Hospital.

Queen Charlotte's Maternity Hospital: Banister, J. Bright, M.D. Camb., F.R.C.S. Edin., Consulting Obstetric Surgeon; Rivett, L. C., M.C. Camb., F.R.C.S. Eng., Obstetric Surgeon to In-patients; Lane-Roberts, C. S., M.S. Lond., F.R.C.S. Eng., Obstetric Surgeon to Out-patients; Jones, A. Morris, M.B., Ch.B., Senior Resident Medical Officer; Cargill, R. E. D., M.R.C.S., L.R.C.P. Lond., and Robertson, J. A. W., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officers.

University of Edinburgh: Lyon, D. Murray, M.D., D.Sc. Edin., F.R.C.P. Edin., D.P.H., F.R.S. Edin., Christison Professor of Therapeutics, in succession to Prof. J. C. Meakins; Greig, Lt.-Col. E. D. W., I.M.S., M.D., D.Sc., Lecturer in Tropical Diseases.

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—Asst. H.S. £130.

Birmingham City Municipal Bacteriological Laboratory.—Asst. Bacteriologist and Asst. Venereal Diseases Officer. £600.

Birmingham Cripples' Union Orthopædic Hospital.—H.S. £250.

Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.

Brentwood Mental Hospital.—Jun. Asst. M.O. £510.

Brighton County Borough Sanatorium.—Res. M.O. £350.

Brighton Education Committee.—Junior School Dentist. £400.

Cambridge, Addenbrooke's Hosp.—Cas. O. and Res. Anæsth. £130.

Cardiff City.—Res. Med. Supt. and Asst. M.O.H. £700.

Derby County Mental Hospital, Mickleover.—Sen. Asst. M.O. £450. Also Locum Tenens M.O. £8 8s. per week.

Evelina Hospital for Children.—H.S. and H.P. £120 each.

Freemasons Hospital and Nursing Home.—Res. M.O. £250.

Gloucestershire Royal Infirmary, Gloucester.—P.

Hull Royal Infirmary.—Asst. H.P. £130.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Lincoln County Hospital.—Jun. H.S. £150.

Liverpool City.—M.O.H. £1800.

London Temperance Hospital.—Cas. O. £150.

Manchester Royal Infirmary, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.

Margate, Royal Sea Bathing Hospital.—H.S. £200.

Middlesex County Council Sanatorium, Harefield.—Locum M.O. £7 per week.

North Middlesex Hospital, Edmonton.—Asst. M.O. £200.

Oldham County Borough.—Asst. M.O.H. £450.

Queen's Hospital for Children, Hackney, E.—Asst. S. to Ear, Nose, and Throat Dept.

Rochdale Infirmary.—M.O. 300 guineas.

Salford Royal Hospital.—Hon. Asst. S.

Seamen's Hospital Society.—S.

Sheffield Royal Infirmary.—Med. Reg. £400. Ophthalmic H.S. £60. Also Asst. S.

Sudan Medical Service.—Medical Inspector. L.E.720.

University College Hospital, Gower-street, W.C.—Non.-Res. House Anæsth. £100.

Ventnor, Royal National Hospital for Consumption, &c.—Sen. Res. M.O. £300.

Willesden General Hospital.—Hon. S.

Births, Marriages, and Deaths.

BIRTHS.

Chapman.—On July 10th, at The Green, Richmond, Surrey, the wife of Capt. R. W. Chapman, R.A.M.C., of a son.

MARRIAGES.

Henderson—Hunter.—On July 12th, at St. Stephen's Parish Church, Perth, Alan Ashton Henderson, M.R.C.S., L.R.C.P., of Golders Green, London, to Dorothy Margaret, youngest daughter of Robert Hunter, of St. John's, Perth, Scotland.

Wilson—Snell.—On July 3rd, at the Parish Church, Kilmington, Devon, Edric Frank Wilson, F.R.C.S. Eng., of Plymouth, son of Mr. and Mrs. F. Wilson, of Acton, Middlesex, to Vera, younger daughter of Mr. and Mrs. R. Snell, of Kilmington.

DEATHS.

Collins.—On July 11th, at "The Mall," Wanstead. Essex, George William Collins, L.R.C.P. Lond., M.R.C.S. Eng.

Mawson.—On July 10th, as the result of an accident, James Hargreave Mawson, L.R.C.P., L.R.C.S., of Moorland-road, Leeds, in his 66th year.

Russell-Wells.—On July 14th, in his 55th year, Sir Sydney Russell-Wells, M.P., M.D. Lond., F.R.C.P. Lond.

Saunders.—On July 7th, Henry William Saunders, M.D., F.R.C.S., of Eastbourne.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

AN IMPROVED METHOD FOR ARTIFICIAL RESPIRATION.

By Dr. Edwin Seaborn.

For some time I have been accustomed to practise a method of artificial respiration which has proved itself in my hands quite useful. I have reviewed medical literature with the object of ascertaining how far the method is original. I shall therefore give a brief account of the methods hitherto recommended before describing that which I have devised.

Methods of Artificial Respiration.

The methods hitherto in use may be classified as follows: (1) Those which either expand or compress the chest to such an extent that air enters the lungs; (2) those in which air, under pressure, is forced into the lungs.

Included in the first class are those of:—

(*a*) Leroy. As the patient lies on his back, pressure is applied to the abdominal wall. On relaxing the pressure the natural recoil of the body allows air to enter the lungs, the inspiration being chiefly of the abdominal type.

(*b*) Howard. The patient lies on his back with a cushion under his shoulders, and strong pressure is applied to the lower chest and abdomen. The recoil of the chest on relaxing the pressure produces inspiration again of an abdominal type.

(*c*) Sylvester. As the patient lies on his back his arms are first pulled strongly over his head. Traction on the chest, through the pectoral muscles, produces inspiration. In the next movement the arms are pressed against the side of the chest, so assisting expiration.

(*d*) Brosch. This method resembles Sylvester's. The arms, after being brought over the head, are pressed while still in this position downwards until the thorax is raised by this leverage from the table. The force applied passes to the chest through the pectoral muscles and through the ligaments of the shoulder-joints to the scapulæ, so expanding and raising the chest and producing inspiration. Expiration is assisted by pressing the arms against the sides of the chest.

(*e*) Shücking. This method also resembles Sylvester's. The arms are pulled laterally from the sides of the body to a point above the head. The latissimus dorsi as well as the pectoral muscles are utilised to expand the chest, and so to produce inspiration. Expiration is assisted by pressing the arms against the sides of the chest.

(*f*) Marshall Hall. The patient lying on his side is allowed to sink face downwards until the front of the chest and abdomen are nearly in contact with the table, thus expelling air. In the next movement he is pulled up by the upper shoulder and hip. The force thus applied passes through the pectoral muscles of the upper shoulder to the chest and so produces inspiration.

(*g*) Francis. While the patient lies on his back, the body is alternatively raised and lowered by a pole thrust across under the chest. When the body is raised, the head and shoulders draw upon the chest through the pectoral and neck muscles, so producing inspiration.

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(*i*) Pacini. While the patient lies on his back with the feet tied to the table, his shoulders are alternately pulled upward and pushed downwards, so producing inspiration and expiration. The force applied passes to the chest through the pectoral and latissimus dorsi muscles.

(*j*) Schroeder (for infants). The child, face upwards, is placed across the operator's hands. To produce expiration the child's body is flexed, approximating its head and feet. To induce inspiration its head and feet are allowed to hang over the edge of the operator's hands. The head and shoulders draw on the chest through the pectoral and neck muscles.

(*k*) Buist (for infants) is much like Schroeder's. The child, face downwards and with the head away from the operator, is held on one of the operator's hands. It is rolled over into the other hand. The child is now face upwards with the head hanging down, and inspiration takes place. The head and shoulders draw on the chest, through the pectoral and neck muscles, so producing inspiration.

(*l*) Schäfer. While the patient lies on his face, strong pressure is applied to the lower part of the thorax. The cubic content of the chest is reduced much below that of even forced expiration. The natural recoil of the chest on relaxing the pressure produces inspiration.

In all the above methods except those of Leroy, Howard, and Schäfer, the expansion of the chest in inspiration depends very largely on traction applied through the pectoral muscles. Unfortunately, in the conditions which render recourse to artificial respiration necessary, the pectoral, like all the other voluntary muscles, have lost their tone, and a large part of the force applied is uselessly expended on the shoulder-joints instead of on the chest.

Of the many methods of the second class—i.e., in which air is *forced into the lungs*—the following are the chief :—

(*m*) The founders of the Royal Humane Society who adopted in 1774 the method utilised by the Dutch Society. The *mouth of the operator is applied to the mouth of the* patient, and the latter's lungs are inflated by blowing. The idea of mouth-to-mouth inflation is probably as old as the idea of resuscitation itself.

(*n*) John Hunter (1776) used a bellows, with double cylinders, which takes the place of the operator's mouth. Air is alternately injected and withdrawn. The ordinary fireside bellows had already been used for centuries for resuscitation.

(*o*) Kite used an apparatus which inflated and deflated the lungs, and his method was adopted by the Royal Society in 1786.

(*p*) Munro employed a catheter which was passed into the larynx, and was attached to a bellows.

Sir Benjamin Brodie, who had been requested to investigate the methods employed in resuscitation, reported against the use of bellows, and their employment was accordingly discontinued during many years thereafter.

(*q*) Hovatch placed the nozzle of a bellows in one nostril, and, while the mouth and other nostril were held closed, air was alternately forced into and withdrawn from the lungs.

(*r*) Stewart and Rogoff placed the nozzle of a bellows in the mouth, and while the nostrils were held closed, alternately forced air into and withdrew it from the lungs. The pressure of air was regulated by a valve.

(*s*) Sir Lauder Brunton, at the International Congress held at Rome in 1894, exhibited an apparatus which utilised an oxygen tank. A nozzle was placed in each nostril.

One disadvantage of all the methods by which air is forced into the mouth, nose, or pharynx is that air enters the stomach and pushes the diaphragm upwards, so diminishing the capacity of the chest. Many means have been suggested for obviating this, and among these are the following :—

(*t*) Roth, in using a bellows and a tightly fitting face-mask, at the same time applied pressure to the œsophagus.

(*u*) Kuhn used an instrument consisting of an inner and outer tube, which was pushed through the larynx, completely filling the glottis. Through the inner tube, a continuous stream of air was forced into the lungs, while through the space between the inner and outer tubes the air as constantly escaped. Just sufficient air pressure as would keep the lungs distended was employed.

(*v*) O'Dwyer and Fell employed an apparatus which very much resembles Kuhn's. It consisted of a double laryngeal tube. By alternately opening and closing the outgoing tube the chest was made to move as in ordinary respiration.

In 1908 Volhard demonstrated that an animal whose muscles had been paralysed by curare could be kept alive by injecting a stream of air into the trachea. He showed also that oxygen is more effective than air.

In 1909 Meltzer and Auer described a method of *inducing anæsthesia* by passing a stream of etherised air through a catheter passed into the trachea as far as the bifurcation of the trachea. At a pressure of 20 to 25 mm. of mercury anæsthesia could be continued indefinitely although no respiratory movements of the chest took place. The catheter employed must be of such calibre as to give space for the return of air from the lungs, otherwise cyanosis occurs. The cyanosis, however, disappears if the stream of ingoing air is stopped for a few seconds. Meltzer and Auer suggested that the apparatus would be of service for the resuscitation of the drowned.

In 1912 the American Medical Association, in coöperation with the National Electric Light Association and the Association of Electrical Engineers, inquired into the means and devices employed for resuscitation. In 1914 the American Government requested the American Medical Association to recommend the apparatus which, in their opinion, would be the most serviceable for use by laymen in emergencies.

American Medical Association's Report and Suggested Method.

The Association named a committee consisting of Dr. G. W. Crile; Dr. Meltzer, of the Rockefeller Institute; W. B. Cannon, of Howard University; James Erlanger, of Washington University; and Yandell Henderson, of Yale. After exhaustive investigations, carried out on animals and man, they reported that existing devices were either mechanically uncertain or that they injured the lungs by withdrawing air under negative pressure. They recommended the use of a new method based on that of Meltzer and Auer already described.

In this modification a suitable metal tube, several sizes of which must be kept on hand, is passed into the pharynx, and a *glass-blower's bellows* is employed to pump air into the lungs. The air-pressure is regulated at 20 to 30 mm. Hg by means of a valve. A heavy weight, secured by a broad bandage, is placed on the belly, or a man is made to sit on the abdomen. The flow of air is interrupted by a valve worked by the hand, so causing inspiration and expiration alternately.

Regarding the physiology of respiration, I would point out *that the hæmoglobin of the aerated blood of the lungs always* carries a full load of oxygen. When more oxygen is needed an increase is effected by a combination of two factors: (1) *by increasing the rapidity of the flow of blood through* the lungs; and (2) by increasing the rate and depth of respiration. The increase of the depth of respiration effects an increase in the surface of lung epithelium exposed to the air. In asphyxia we can control the second factor only, and that by artificial respiration. To compensate for the feebleness of the circulation the aerating surface, and therefore *the air content of the lungs, should be increased to its* maximum.

Technique of the New Method.

The method which I have devised, and shall now describe, seems to be particularly adapted *to* achieve this result.

As we have seen, most of the methods depend upon indirect traction on the pectoral muscles. The new method depends upon traction applied directly to these same muscles, the toneless condition of which now aids in the procedure.

A man stands on each side of the patient, each with palms held upwards; each grasps very firmly with both hands the anterior axillary folds. The hand which is nearer to the patient's head passes deeply into the axilla and takes a broad hold of the pectoralis major and minor muscles. The other hand grasps the anterior axillary fold as low on the chest as possible, so taking hold of the lower part of the origin of the pectoralis major muscle. Traction is then applied in both an upward and outward direction until the thorax is lifted from the table, and until the lower part of the latter is expanded to its greatest extent. A long blast of air is heard to whistle through the larynx. This whistling continues for several seconds. It is most important that traction be continued until the whistling ceases, as otherwise the area of lung inflated with air does not arrive at its maximum. In this method both the upper and lower thorax are fully expanded. It would appear that the diaphragm descends and, owing to the lateral traction, is pulled out flat. To aid expiration pressure is applied through the operator's hands to the chest-wall, but the grasp on the axillary folds need not, during this movement, be relaxed. These movements are performed alternately. Where two men are not available this method of practising artificial respiration can be carried out by one operator standing at the patient's head. The best results, however, cannot be obtained in this way, as the lateral pull outwards cannot be applied with the same force. The method is not one exclusively for the operating-table, but may equally well be applied in the case of the apparently drowned, after clearing as far as possible the air-passages of water or other substances.

Advantages of the New Method.

The author in several cases of asphyxia has had the opportunity of comparing this method with those of the first class already described. From the intensity and duration of the whistling in the larynx it becomes immediately apparent that the amount of air which enters the lungs at each respiration is very much greater than in any of these other methods.

With a view to measuring the volume of air which enters and leaves the lungs with each respiration, experiments were conducted on the cadaver in the pathological department of St. George's Hospital, and with the assistance of Dr. Robert Donaldson, head of that department.

In all the methods of the first class very little air entered or left the lungs. In no case was there a flow of more than a few cubic centimetres, so few, indeed, that the amount could not be conveniently measured in the spirometer employed. In the method which I advocate there was constantly, with each movement, a flow of 200 cubic centimetres of air.

I believe that the method is superior to all others because of the greater air-intake, because it can be applied at once, because of its extreme ease of application, because no apparatus is necessary, and because it can be applied with little risk of sepsis during an abdominal operation. It should be applied *immediately* after the patient's respirations fail.

I would suggest that a funnel attached to an oxygen tank be placed close to the patient's mouth. I would further suggest that pressure be put on the abdominal aorta and inferior vena cava, and on the brachial arteries and veins so that the blood may be determined to the brain and respiratory centres. These centres are very rapidly and profoundly damaged by lack of oxygen, so profoundly, indeed, that they may be unable to recover even though the heart-beats may for a time increase in rate and power.

(*Continued at foot of next page.*)

Elvins, R. S., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., Police Surgeon at Scarborough.

Fagan, R. F., M.B., B.S., D.P.H., Pathologist to St. John's Hospital for Diseases of the Skin.

McAlpine, Douglas, M.B., Ch.B. Glasg., M.R.C.P. Lond., Physician to the Department for Nervous Diseases at the Middlesex Hospital.

Scott, Evelyn M., M.B., B.S. Durh., Junior Resident Medical Officer, Royal Infirmary, Sunderland, to act as House Physician at the Children's Hospital.

Queen Charlotte's Maternity Hospital: Banister, J. Bright, M.D. Camb., F.R.C.S. Edin., Consulting Obstetric Surgeon; Rivett, L. C., M.C. Camb., F.R.C.S. Eng., Obstetric Surgeon to In-patients; Lane-Roberts, C. S., M.S. Lond., F.R.C.S. Eng., Obstetric Surgeon to Out-patients; Jones, A. Morris, M.B., Ch.B., Senior Resident Medical Officer; Cargill, R. E. D., M.R.C.S., L.R.C.P. Lond., and Robertson, J. A. W., M.R.C.S., L.R.C.P. Lond., Assistant Resident Medical Officers.

University of Edinburgh: Lyon, D. Murray, M.D., D.Sc. Edin., F.R.C.P. Edin., D.P.H., F.R.S. Edin., Christison Professor of Therapeutics, in succession to Prof. J. C. Meakins; Greig, Lt.-Col. E. D. W., I.M.S., M.D., D.Sc., Lecturer in Tropical Diseases.

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—Asst. H.S. £130.
Birmingham City Municipal Bacteriological Laboratory.—Asst. Bacteriologist and Asst. Venereal Diseases Officer. £600.
Birmingham Cripples' Union Orthopædic Hospital.—H.S. £250.
Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.
Brentwood Mental Hospital.—Jun. Asst. M.O. £510.
Brighton County Borough Sanatorium.—Res. M.O. £350.
Brighton Education Committee.—Junior School Dentist. £400.
Cambridge, Addenbrooke's Hosp.—Cas. O. and Res. Anæsth. £130.
Cardiff City.—Res. Med. Supt. and Asst. M.O.H. £700.
Derby County Mental Hospital, Mickleover.—Sen. Asst. M.O. £450. Also Locum Tenens M.O. £8 8*s.* per week.
Evelina Hospital for Children.—H.S. and H.P. £120 each.
Freemasons Hospital and Nursing Home.—Res. M.O. £250.
Gloucestershire Royal Infirmary, Gloucester.—P.
Hull Royal Infirmary.—Asst. H.P. £130.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
Lincoln County Hospital.—Jun. H.S. £150.
Liverpool City.—M.O.H. £1800.
London Temperance Hospital.—Cas. O. £150.
Manchester Royal Infirmary, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.
Margate, Royal Sea Bathing Hospital.—H.S. £200.
Middlesex County Council Sanatorium, Harefield.—Locum M.O. £7 per week.
North Middlesex Hospital, Edmonton.—Asst. M.O. £200.
Oldham County Borough.—Asst. M.O.H. £450.
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An Address

ON

YESTERDAY, TO-DAY, AND TO-MORROW.

Being the Presidential Address delivered at the Annual Meeting of the British Medical Association in Bradford on July 22nd, 1924,

By J. BASIL HALL, M.A., M.Ch. Camb.,
HONORARY CONSULTING SURGEON, BRADFORD ROYAL INFIRMARY.

My Lord Bishop, Ladies and Gentlemen,—As a Bradford citizen, my first words must be those of a very warm welcome to the British Medical Association. As the President of that Association, on the other hand, I can truly say that I, and every other member of it, have greatly appreciated the very cordial and hospitable reception which the citizens of Bradford have given to us. Although our Association has existed for upwards of 90 years without visiting this city, I can assure you that it was recognised long ago that Bradford had only to be asked and a generous response would be forthcoming.

There is an incident in the history of this city which coincides with the birth of the British Medical Association. In 1832 the Association came into being, and almost simultaneously the town of Bradford was granted the privilege of returning two Members of Parliament. Whether this privilege proved a boon to the city or otherwise I do not know, because I am ignorant of the political views which those Members held. I can only say that I hope they coincided with my own. As regards the birth of the British Medical Association, however, I have no doubts. That great body has done an unspeakable service in binding together the great mass of the medical profession into one solid professional unity. At its inauguration in Worcester by Sir Charles Hastings some 50 original members were enrolled. To-day its membership numbers 27,000 members, scattered over the whole world, and it can justly claim that its voice is the voice of a profession throughout an empire upon which the sun never sets.

I am not going to weary you by recording all that this great Association has accomplished during its long existence, but I cannot refrain from mentioning what I regard as its greatest achievement. When war broke out in 1914 our army was served by the Royal Army Medical Corps. That is a very small body, large enough to give medical service to our soldiers in times of peace, but totally inadequate to meet the requirements of a great war. The British Medical Association promptly established a central war committee and through it provided for our army a regular and organised supply of medical officers throughout the whole campaign. The cost of that patriotic service amounted to £20,000, and it is the proud boast of this country to-day that the care of the sick and wounded has never been equalled in the previous history of the world. If the Association had never done anything else, its war record has more than justified its existence.

Before proceeding further I want to express my very sincere thanks for the loyal and unstinted help which has been so generously given in order that this meeting, the first of its kind in Bradford, should prove a success. When I look back upon the past 12 months and try to realise all the generous service which has been so willingly rendered, I feel that I cannot adequately express my thanks. To name some and omit others would appear invidious, but I must mention our Lord Mayor and others who represent the corporation of this city; and I would especially thank the ladies' committees who have done such yeoman service. Even in the Garden of Eden Adam was a failure till Eve came along, and although she let him down very badly to begin with, she has since earned his eternal gratitude, and we recognise to-day that without her coöperation our annual meetings must prove a failure.

A gathering like this is not merely a national conference. It is something which knits together a professional brotherhood which extends throughout the world. It brings together representatives from all parts of the British Isles, from our overseas dominions, and from the great contingents of Europe and America. It accepts representatives of all those who work with a common object from nations outside our Empire, and it welcomes them as members of a great medical fraternity. There is no such word as "foreign" in the world of medicine. Politicians talk about a League of Nations, but in medicine nations count as nothing. The fight against disease is carried on wherever the human race exists, and we recognise that each does his best according to the knowledge vouchsafed to him. I was told recently that Bradford had no medical traditions and its reputation had still to be made. I accepted the insult with equanimity because I felt I was in the company of several to whom I could bow the knee without humiliation. My mind went back to Dr. Sharpe and to the first Dr. Meade, both Fellows of the Royal Society; and then to the late Dr. John Bell, Dr. Goyder, and others who demonstrated that woolsorters' disease was due to the anthrax bacillus. Also to the late Sir Thomas Stephenson, who became adviser to the Home Office in medical jurisprudence, and who, by his expert evidence, brought many criminals to justice. Then to the most kind-hearted little man I ever knew, the late Dr. Major, an expert in mental disease, one whose whole desire in life was to help everybody. In later days there remains with us the memory of Dr. James Kerr, who left Bradford to become the medical officer of the London School Board—a brilliant scholar, who never realised how brilliant he was even when it was impressed upon him by others. Perhaps I ought not to say anything about those who still remain with us, but I am tempted to express my admiration for the long and patient work which has been given to the effort to discover a sure means of disinfection of wool without destroying its commercial value, and I hope that this will one day obtain success and a well-deserved recognition.

Bradford is essentially a commercial centre, and its citizens respect everyone who advances commercial prosperity. They are enthusiastic in promoting education which has a practical and not merely an academic value. Nevertheless, it is a curious fact, if history be true, that the city owes much of its prosperity to a clergyman. The invention of the power loom emanated from Dr. Cartwright, a Fellow of Magdalen College, Oxford, afterwards incumbent of Brampton in Yorkshire and Prebendary of Lincoln Cathedral. Incidentally, he married an heiress and perhaps she, too, did much to make that invention possible. Thanks to the late Lord Masham's father, his memory is perpetuated by the Cartwright Memorial Hall in Lister Park.

My predecessor has handed on to me the difficult task of delivering a presidential address, and my only comfort is that you will not be allowed to express any criticisms upon my efforts. Reflections on the past and prophecies about the future are time-honoured but very hackneyed topics, but I am going to say something to-night about "The Yesterday, the To-day, and the To-morrow" of medicine.

I think that we are tending to lose our veneration for the past: perhaps we are too conceited about our present, and expect too much of the future. It is only human nature when most of us smile superciliously at the lack of scientific knowledge of our early medical ancestors and fail to appreciate the magnificent courage and perseverance with which they fought a losing battle against disease. Rudyard Kipling accurately described our modern mental attitude when he wrote:—

> "Wonderful little, when all is said,
> Wonderful little, our fathers knew,
> Half their remedies cured you dead,
> Most of their teaching was quite untrue."

PUBLIC HEALTH IN CAPE TOWN.

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Race.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Diseases respiratory system.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
European . ..	107,430	22·3	11·1	0·7	0·9	1·4	30	82	4·6
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It will be noted that the statistics of the European population of Cape Town do not differ appreciably from those of a clean-aired English town, while the non-European population has a very high birth-rate and an excessive death-rate from all causes, tuberculosis and respiratory diseases, the death-rate from cancer being low and the maternity mortality from childbirth being equal to that of the Europeans. Dr. Higgins, in presenting the report, pays a tribute to the good work of his predecessor, Dr. A. Jasper Anderson, the first whole-time medical officer of health for the city, who gave up his appointment on March 31st, 1923, after over 21 years' service.

A study of the report makes it obvious that public health problems in Cape Town are not essentially different from those in the old country. Thus, among the admissions to the City Hospital for Infectious Diseases, the only unusual ailments are one fatal case of anthrax, and one case of Malta fever which recovered. Enteric fever heads the list numerically, as might have happened in an English hospital during the 'eighties of last century. In the table giving the causes of death, the most striking features are the prominence of enteric fever among both races, and of diarrhœa, disease of the stomach, enteritis, syphilis, bronchitis, and pneumonia amongst the non-European population. During the year seven cases of leprosy were notified, one European female and three each of non-European males and females. There were no deaths from leprosy recorded. An outbreak of influenza occurred during June, 1922, and continued into the year under review, and was accountable for seven European and five non-European deaths. As in many parts of England, a small-pox hospital serves the purpose of many surrounding districts. The report of the maternity and child welfare work, submitted by Dr. Mary van Ingen, shows that this department is administered on similar lines to those at home. There are ten sanitary inspectresses and a chief. The notification of every child born after the completion of the sixth month of pregnancy, whether alive or dead, is required within 24 hours. Of 7088 births notified during the year, 6337 were notified by midwives and nurses, 740 by parents and others, and 11 by doctors. Five bureaus for infant consultations are in operation, and their work continues to increase. Voluntary workers give their help. Minor ailments are treated at the bureaus, dried mild is supplied to infants who cannot be breast-fed, and free dinners are provided at two centres for poor nursing mothers. A sanatorium is needed for tuberculosis, as the accommodation in the infectious diseases hospital is inadequate. Last year 100 cases were admitted to the last-named hospital. Dr. W. P. Cooney, in his report as to the work of the male V.D. centre, emphasises the need for education of the public, and points out that suitably trained coloured and native lecturers would do an immense amount of good in this direction.

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An Address

ON

YESTERDAY, TO-DAY, AND TO-MORROW.

Being the Presidential Address delivered at the Annual Meeting of the British Medical Association in Bradford on July 22nd, 1924,

BY J. BASIL HALL, M.A., M.CH. CAMB.,
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MY LORD BISHOP, LADIES AND GENTLEMEN,—As a Bradford citizen, my first words must be those of a very warm welcome to the British Medical Association. As the President of that Association, on the other hand, I can truly say that I, and every other member of it, have greatly appreciated the very cordial and hospitable reception which the citizens of Bradford have given to us. Although our Association has existed for upwards of 90 years without visiting this city, I can assure you that it was recognised long ago that Bradford had only to be asked and a generous response would be forthcoming.

There is an incident in the history of this city which coincides with the birth of the British Medical Association. In 1832 the Association came into being, and almost simultaneously the town of Bradford was granted the privilege of returning two Members of Parliament. Whether this privilege proved a boon to the city or otherwise I do not know, because I am ignorant of the political views which those Members held. I can only say that I hope they coincided with my own. As regards the birth of the British Medical Association, however, I have no doubts. That great body has done an unspeakable service in binding together the great mass of the medical profession into one solid professional unity. At its inauguration in Worcester by Sir Charles Hastings some 50 original members were enrolled. To-day its membership numbers 27,000 members, scattered over the whole world, and it can justly claim that its voice is the voice of a profession throughout an empire upon which the sun never sets.

I am not going to weary you by recording all that this great Association has accomplished during its long existence, but I cannot refrain from mentioning what I regard as its greatest achievement. When war broke out in 1914 our army was served by the Royal Army Medical Corps. That is a very small body, large enough to give medical service to our soldiers in times of peace, but totally inadequate to meet the requirements of a great war. The British Medical Association promptly established a central war committee and through it provided for our army a regular and organised supply of medical officers throughout the whole campaign. The cost of that patriotic service amounted to £20,000, and it is the proud boast of this country to-day that the care of the sick and wounded has never been equalled in the previous history of the world. If the Association had never done anything else, its war record has more than justified its existence.

Before proceeding further I want to express my very sincere thanks for the loyal and unstinted help which has been so generously given in order that this meeting, the first of its kind in Bradford, should prove a success. When I look back upon the past 12 months and try to realise all the generous service which has been so willingly rendered, I feel that I cannot adequately express my thanks. To name some and omit others would appear invidious, but I must mention our Lord Mayor and others who represent the corporation of this city; and I would especially thank the ladies' committees who have done such yeomen service. Even in the Garden of Eden Adam was a failure till Eve came along, and although she let him down very badly to begin with, she has since earned his eternal gratitude, and we recognise to-day that without her coöperation our annual meetings must prove a failure.

A gathering like this is not merely a national conference. It is something which knits together a professional brotherhood which extends throughout the world. It brings together representatives from all parts of the British Isles, from our overseas dominions, and from the great contingents of Europe and America. It accepts representatives of all those who work with a common object from nations outside our Empire, and it welcomes them as members of a great medical fraternity. There is no such word as "foreign" in the world of medicine. Politicians talk about a League of Nations, but in medicine nations count as nothing. The fight against disease is carried on wherever the human race exists, and we recognise that each does his best according to the knowledge vouchsafed to him. I was told recently that Bradford had no medical traditions and its reputation had still to be made. I accepted the insult with equanimity because I felt I was in the company of several to whom I could bow the knee without humiliation. My mind went back to Dr. Sharpe and to the first Dr. Meade, both Fellows of the Royal Society: and then to the late Dr. John Bell, Dr. Goyder, and others who demonstrated that woolsorters' disease was due to the anthrax bacillus. Also to the late Sir Thomas Stephenson, who became adviser to the Home Office in medical jurisprudence, and who, by his expert evidence, brought many criminals to justice. Then to the most kind-hearted little man I ever knew, the late Dr. Major, an expert in mental disease, one whose whole desire in life was to help everybody. In later days there remains with us the memory of Dr. James Kerr, who left Bradford to become the medical officer of the London School Board—a brilliant scholar, who never realised how brilliant he was even when it was impressed upon him by others. Perhaps I ought not to say anything about those who still remain with us, but I am tempted to express my admiration for the long and patient work which has been given to the effort to discover a sure means of disinfection of wool without destroying its commercial value, and I hope that this will one day obtain success and a well-deserved recognition.

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> "Wonderful little, when all is said,
> Wonderful little, our fathers knew,
> Half their remedies cured you dead,
> Most of their teaching was quite untrue."

But having written it, he pays them just tribute by adding :—

> " Yet when sickness was sore in the land,
> When neither planet nor herb assuaged,
> They took their lives in their lancet hand,
> And, oh, what a wonderful war they waged !
> Yes, when the crosses were chalked on the door,
> Yes, when the terrible death cart rolled,
> Excellent courage our fathers bore,
> Excellent hearts had our fathers of old,
> None too learned, yet nobly bold,
> Into the fight went our fathers of old."

The whole world of medicine has so completely changed that we can obtain no true perspective of those early times. The medical student of to-day cannot visualise the conditions against which his predecessors fought. In our eagerness to obtain scientific knowledge and our confidence in modern methods we are losing sight of the traditions of the past. Some of them may be quite untrue in the light of modern knowledge, but many of them still remain as a sure and solid foundation of good practice. Moreover, whatever we may think of the lack of knowledge in the early periods of medicine, there has been handed down to us a precept which every one of us might well adopt as a guiding principle in professional life. Two hundred years ago there lived a great French surgeon, Guy de Chauillac. His epitaph remains to-day as a motto for us all. He lived in a decadent period. He fought and successfully overcame many foolish and superstitious doctrines which were then in vogue. His life was a stormy one, a fight against prejudice and superstition, and when it ended, his service was recognised by an epitaph which he had truly earned :—

> " Bold when sure,
> Cautious in danger,
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Knowledge is a priceless possession, but the mere acquirement of it derived from the labour of others goes a very short way towards the formation of a career which will give a lasting benefit to mankind. Moreover, it has an ever-varying and ever-changing value. What we take pride in to-day will be regarded as crude and foolish to-morrow, but that indefinable quality, character, and wisdom in the application of knowledge will make our memory live.

During the Victorian era two great discoveries were made which paved the way for the surgical triumphs of to-day. Strictly speaking, neither of them were discoveries, but rather the wise application of scientific knowledge to a practical use. The properties of nitrous oxide gas had been known long before it was suggested that its use might enable surgical operations to be performed during a period of unconsciousness. Pasteur's researches suggested to Lister that their practical application in surgery had great possibilities, and by his wise application of those researches he handed down to us an unspeakable blessing to humanity. It has been truly said that Lister by his teachings has saved more lives than Napoleon destroyed ; and the introduction of the use of anæsthesia has given us the greatest of God's gifts—the relief from pain. Anæsthesia in surgical operations abolished the dread of pain ; and Lister's application of the germ theory destroyed the spectre of septic infection. Every civilised nation pays homage to Lord Lister to-day, and no less to Pasteur. Their names are known and revered throughout the whole world.

It is a curious fact, however, that the circumstances of the birth of anæsthesia have been almost forgotten. Horace Wells, a dentist in Hartford, Connecticut, first conceived and put into practice the principle of inducing unconsciousness during dental operations by the inhalation of nitrous oxide gas. In December, 1844, he induced a friend to administer the gas to him for the extraction of a tooth, and encouraged by success he repeated the experiment on others. He subsequently gave a demonstration in Boston of his methods ; but whether from nervousness, or from some other cause, the demonstration proved unsatisfactory and he was pronounced an impostor. Disheartened at length by the failure of repeated attempts to establish his claims, his mind became unhinged, and for a time he wandered about the streets in New York. On Jan. 4th, 1848, he was arrested on a charge of vitriol throwing, and while he was in gaol he committed suicide. Thus closed, at the age of 32 years, the career of Horace Wells, to whom at least belongs the credit of having first shown the practicability of producing unconsciousness by nitrous oxide gas, and of having thus, in his own words, established " the principle of anæsthesia."

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The recent war introduced a period in the history of medicine during which everything was subordinated to the requirements of military service. It was a service which presented special problems and conditions of which we had no previous conception. No one had fully realised the enormous power of high explosives and the destructive capacity of all the devices of modern warfare. During the first few weeks of the war our confidence in the principles of our routine surgical practice were rudely shaken, and it was speedily recognised that special methods of wound treatment must be devised to meet the extraordinary conditions with which we had to deal. Those special methods were not long delayed. At the outset tetanus and gas gangrene threatened to produce an appalling mortality amongst the wounded. In a very short space of time, thanks to the adoption of preventive inoculation, deaths from tetanus became a negligible quantity. At the same time a special surgical technique, almost grotesque in its extravagance, was devised to prevent the occurrence of gas gangrene, and this most terrible and fatal form of wound infection soon became little more than a nightmare of the past. I had the privilege of serving in the Mediterranean force during the second and third years of the war. I never saw a single case of tetanus, and I can only remember one fatal case of gas gangrene. Our victory over these scourges of every army in past history was gained by methods which were inspired by the teaching of two men, Pasteur and Lister. If there is nothing else which should bind England and France together in a bond of everlasting friendship, surely the memory of these two men is sufficient to make us realise that humanity owes a great debt to both nations, a debt which the world can surely never forget.

I do not think, however, that our recent military experiences have done much to advance our usefulness in dealing with sickness in civil life. The demands of war service, the urgent necessity for getting men back into the firing line, or of discharging them from hospital in order to make room for others, created a perfect orgy of exaggerated methods of treatment. Mr. Hamilton Russell, of Melbourne, truly wrote a few years ago: "The present methods of wound treatment have arisen largely by reason of the special character of war injuries as distinguished from those seen in civil practice. The injuries of civil life, however, remain what they were before, and it is necessary to exercise a wise discretion in introducing methods appropriate to war injuries into the much milder type of cases usual in civil life."

The whole war period brought into focus an exaggerated idea of the importance of surgical technique, and cramped the development of surgical judgment. The treatment of every injury and every disease became standardised, and each was passed through the same mill without consideration of qualifying circumstances. It was a bad training for the newly-qualified student of medicine. He was forced to deal with cases and not with patients, and my own personal experience convinced me that the loyal service which our young men so gladly gave to the nation impaired their subsequent usefulness in civil life. Each became a mere cogwheel in a great machine designed to fulfil a special purpose. During the most impressionable period of their career they worked amongst all the sensational excitement associated with military service, and "the daily round and common task" of civil practice is now an irksome experience for them. Hence is largely derived the widespread desire to practise some form of specialism. Specialism has become an idol which all and sundry worship. Not very long ago a well-known teacher in a great London school deplored this modern tendency in medicine. He said: "Everything is becoming divided into special classes and clinics, and the lecturer deals with his students as embryo specialists in the subjects in which he himself is expert. The necessary solid foundation of general knowledge upon which specialism should be built is receiving too scant attention, and the rising generation is being taught to run before it has learnt to walk." The late Sir William Macewen, whose recent death we deplore, once said, "No one can become a good surgeon unless he is first a good physician." It is an axiom which we should never forget, and it behoves every one to equip himself with a wide knowledge of general medicine before attempting to launch his boat upon the stormy sea of operative surgery. To the layman the term specialist has become a cabalistic word which he repeats upon every possible occasion. There is, however, *one* specialism which he frequently fails to appreciate at its proper value—the specialism of general practice. It requires more knowledge of human nature, and more experience over a wide field of observation, to make a really first-class general practitioner than the public has any cognisance of.

It would be absurd to depreciate the value of the many scientific methods of investigation which are available at the present time, but I am sure that a too ready appeal to them is doing much to destroy the initiative in the younger generation to think for themselves. Clinical observation threatens to become a lost art. Radiography and all the modern scientific methods are good servants but bad masters. There is a whole world of wisdom in an anecdote I heard recently. A patient presented himself before a surgeon, armed with a bundle of X ray photographs and reports of various kinds. The surgeon put them all on one side and said; "We will look at these presently, but in the meantime just get on to that couch and I will endeavour to find out what you are suffering from. After that, all these things *may* help to prove whether I am right or wrong."

I would insist, therefore, that our present failing is an over-confidence in modern technique and a lack of appreciation of the value of that wisdom which can only be obtained by personal observation and experience. I would urge the younger generation to think more and observe more for themselves, as their forefathers did, and not be so ready to bow the knee in a fanatical worship of so-called scientific methods of investigation and treatment. I would ask them to reflect on all the special methods which have been put forward during the past 35 years, from tuberculin down to deep X ray therapy for cancer, to realise how many have failed to stand the test of experience, and to reflect on all the bitter disappointments which have been inflicted by the thoughtless optimism with which each has been advocated. Our scientific knowledge has been greatly advanced, but knowledge avails us very little unless we cultivate the wisdom to gauge its practical value and apply it usefully:—

> "Knowledge and wisdom, far from being one
> Have oft times no connexion; knowledge dwells
> In heads replete with thoughts of other men,
> Wisdom in minds attentive to their own.
> Knowledge is proud that he has learned so much,
> Wisdom is humble that he knows no more."

What of the future? The day is coming when it will cease to be said that—

> "We are afflicted by what we can prove,
> We are distracted by what we know,"

because we shall obtain presently a truer perspective of the scientific methods of to-day. Experience, begotten by patient observation, will teach us their real value and their limitations. Some will be discarded, some may become a sheet anchor in times of doubt. Each will add their quota to our knowledge if they be wisely used, and not merely applied empirically just because they appeal to the popular craze of the moment. We must each play our part by developing our personal observation and experience, and not be content to invoke specialisms to solve those problems which we ought to decide for ourselves. If we do that we shall each add something to the sum of human happiness; and that, after all, is the one thing worth living for. Then when we have grown old, and the world has forgotten what we have done in the past, we shall find comfort in that consolation which has been given to every one who has striven to do his best:—

> "When earth's *last* picture is painted, and the tubes are twisted and dried,
> When the oldest colours have faded, and the youngest critic has died,
> We shall rest; and faith we shall need it, lie down for an æon or two
> Till the Master of all good workmen will put us to work anew.
> And only 'The Master' shall *praise us, and only* 'The Master' shall blame,
> And no one shall work for money, and no one shall work for fame,
> But each *for joy of the* working, and each in his separate star,
> Shall paint the things as he sees them for the God of things as they are."

An Address

ENTITLED

IS THE STATISTICAL METHOD OF ANY VALUE IN MEDICAL RESEARCH?

Delivered in the Institute of Pathology and Research, St. Mary's Hospital, on May 22nd, 1924,

BY MAJOR GREENWOOD, F.R.C.P. LOND.,
MEDICAL OFFICER (MEDICAL STATISTICS), MINISTRY OF HEALTH.

I RECOGNISE that there is a touch of disingenuousness in my choice of title; few human passions are stronger than vanity, and there are not many men whose love of truth is so compelling that they can stand up and confess to their fellows that the studies to which they have devoted many years are futile. I am not one of those rare spirits: the fact that I ask this question implies that I think I can answer it affirmatively, so I am an advocate, not a judge. But this I can plead in extenuation; my opinion of the statistical method has changed in the 20 years during which it has been my principal study: in some ways I value it more, in others less, than I did

But having written it, he pays them just tribute by adding:—

" Yet when sickness was sore in the land,
When neither planet nor herb assuaged,
They took their lives in their lancet hand,
And, oh, what a wonderful war they waged!
Yes, when the crosses were chalked on the door,
Yes, when the terrible death cart rolled,
Excellent courage our fathers bore,
Excellent hearts had our fathers of old,
None too learned, yet nobly bold,
Into the fight went our fathers of old."

The whole world of medicine has so completely changed that we can obtain no true perspective of those early times. The medical student of to-day cannot visualise the conditions against which his predecessors fought. In our eagerness to obtain scientific knowledge and our confidence in modern methods we are losing sight of the traditions of the past. Some of them may be quite untrue in the light of modern knowledge, but many of them still remain as a sure and solid foundation of good practice. Moreover, whatever we may think of the lack of knowledge in the early periods of medicine, there has been handed down to us a precept which every one of us might well adopt as a guiding principle in professional life. Two hundred years ago there lived a great French surgeon, Guy de Chauillac. His epitaph remains to-day as a motto for us all. He lived in a decadent period. He fought and successfully overcame many foolish and superstitious doctrines which were then in vogue. His life was a stormy one, a fight against prejudice and superstition, and when it ended, his service was recognised by an epitaph which he had truly earned:—

" Bold when sure,
Cautious in danger,
Kind to the sick,
Friendly with fellow-workers,
Not greedy of gain."

Knowledge is a priceless possession, but the mere acquirement of it derived from the labour of others goes a very short way towards the formation of a career which will give a lasting benefit to mankind. Moreover, it has an ever-varying and ever-changing value. What we take pride in to-day will be regarded as crude and foolish to-morrow, but that indefinable quality, character, and wisdom in the application of knowledge will make our memory live.

During the Victorian era two great discoveries were made which paved the way for the surgical triumphs of to-day. Strictly speaking, neither of them were discoveries, but rather the wise application of scientific knowledge to a practical use. The properties of nitrous oxide gas had been known long before it was suggested that its use might enable surgical operations to be performed during a period of unconsciousness. Pasteur's researches suggested to Lister that their practical application in surgery had great possibilities, and by his wise application of those researches he handed down to us an unspeakable blessing to humanity. It has been truly said that Lister by his teachings has saved more lives than Napoleon destroyed; and the introduction of the use of anæsthesia has given us the greatest of God's gifts—the relief from pain. Anæsthesia in surgical operations abolished the dread of pain; and Lister's application of the germ theory destroyed the spectre of septic infection. Every civilised nation pays homage to Lord Lister to-day, and no less to Pasteur. Their names are known and revered throughout the whole world.

It is a curious fact, however, that the circumstances of the birth of anæsthesia have been almost forgotten. Horace Wells, a dentist in Hartford, Connecticut, first conceived and put into practice the principle of inducing unconsciousness during dental operations by the inhalation of nitrous oxide gas. In December, 1844, he induced a friend to administer the gas to him for the extraction of a tooth, and encouraged by success he repeated the experiment on others. He subsequently gave a demonstration in Boston of his methods; but whether from nervousness, or from some other cause, the demonstration proved unsatisfactory and he was pronounced an impostor. Disheartened at length by the failure of repeated attempts to establish his claims, his mind became unhinged, and for a time he wandered about the streets in New York. On Jan. 4th, 1848, he was arrested on a charge of vitriol throwing, and while he was in gaol he committed suicide. Thus closed, at the age of 32 years, the career of Horace Wells, to whom at least belongs the credit of having first shown the practicability of producing unconsciousness by nitrous oxide gas, and of having thus, in his own words, established " the principle of anæsthesia."

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I do not think, however, that our recent military experiences have done much to advance our usefulness will prevent us from discerning the general laws of the collectivity. Perhaps the old London tradesman might have used of his method the words of a physician whom Sydenham loved: "Ὅστις δὲ ταῦτα ἀποβαλὼν καὶ ἀποδοκιμάσας πάντα ἑτέρῃ ὁδῷ καὶ ἑτέρῳ σχήματι ἐπιχειρέει ζητέειν, καὶ φήσει τι εὑρηκέναι, ἐξηπάτηται καὶ ἐξαπατᾶται· ἀδύνατον γάρ. (He who, casting aside and rejecting all these methods, essays to find truth by another path and with another method and proclaims that he has discovered something is deceiving and deceived. The thing is impossible.)

IS THE STATISTICAL METHOD EXHAUSTED?

But my candid critic may accept all this and still refuse to recognise the modern statistician as a scientific investigator. He will say: "I am quite prepared to recognise that Graunt and those inspired by him did valuable work. I agree that it *was* necessary both for honest propaganda—for calling attention to the existence of great evils which might be remedied—and even for suggesting fruitful topics of *real* research, that systematic vital statistics should be compiled and published. But in the preparation and interpretation of these statistics, one needs no more than plain good sense. Because the results of their labours are useful, the compilers and analysers of these statistics are no more entitled to rank as scientific investigators than are the equally useful artisans who manufacture our laboratory apparatus. Indeed, when I glance at the pages of acrimonious dispute between rival statisticians touching the scientific claims of different 'coefficients' I am reminded of Sam Johnson's remark: 'Sir, there is no settling the point of precedency between a louse and a flea.'"

Let us consider these two perfectly reasonable contentions: (1) That there is, properly speaking, no special method or art of medical statistics, plain good sense is all that is required; (2) that there is no longer any scope for originality in statistical research, that now, after all these years of tabulation and publication, statistics are on the plane of repetitive semi-skilled manufacture.

THE TERRIBLE RESULTS OF COMMON SENSE.

Is it a fact that a man of good sense can be trusted to interpret statistical data without either special training or (as in Graunt's case) special ability? In 1801 Dr. William Heberden the Younger published "Observations on the Increase and Decrease of Different Diseases." Heberden was something more than a mere man of good sense; he was a scholar, an experienced physician, and had family interest in medico-statistical investigations. His father, one of the most famous of eighteenth century physicians, financed a continuation of Graunt's work by Corbyn Morris. Heberden, then, went over the ground fairly acquainted with his predecessor's work and reached a conclusion which attracted a good deal of attention; he said, "there is scarcely any fact to be collected from the bills of mortality more worthy the attention of physicians than the gradual decline of dysentery." Heberden took together the three titles, bloody flux, colic, and griping in the guts, he showed that the annual average was more than 1000 in the first decade of the eighteenth century, fell to 770, to 700, to 350, 150, 110, 80, 70, 40, and finally 20 in the decade 1790–1800. He attributed this decline to greater cleanliness and better ventilation. But, as Creighton pointed out,[3] Heberden had simply made a statistical mistake; he had supposed "griping in the guts" to be dysentery when it really meant infantile diarrhœa; he made this mistake by overlooking the age-incidence of the deaths assigned to griping in the guts and did not notice that the total had been gradually transferred to the rubric convulsions. He *did* notice that the numbers assigned to convulsions had increased, but explained it by the transfer to this heading of chrisomes and infants, but did not remark (*a*) that transfer had been made already while convulsions were still a small total, (*b*) the gross total of chrisomes and infants was never large enough to make a difference of the required order of magnitude. If you compare Heberden's treatment of this case with Graunt's treatment of the question of whether rickets were a "new disease" in or about 1634, I think you will have no difficulty in deciding that Graunt did have a critical faculty which is really something more than simple good sense, and that a very sensible man like Heberden may blunder badly.

It would be easy enough to mention examples more recent than that of Heberden. Such mistakes look very foolish *when they are pointed out;* but a dozen of them will be made by very intelligent men within a year. I think we may accept the proposition that there is a kind of statistical tact, which is rather more than simple good sense; some are born with it, like Graunt; the rest of us have to acquire it. The second point raised by my objector is worth more consideration.

I wish to consider it under two subdivisions—first, when we confine the scope of the statistical method to what Graunt modestly called his shop arithmetic or to developments of that shop arithmetic which would have been quite intelligible to him; secondly, when we bring into the account a modern calculus which would have been almost as hard for Graunt to understand as it is for many, even laboratory workers, in the twentieth century.

LIFE-TABLES.

I choose as an example under the first heading the case of life-tables. Graunt made the first life-table, and the difference between the last English life-table, with its serried ranks of numerals, and the few figures of Graunt is of detail, very important detail of course, not of principle. A life-table purports to tell us how many of a fictitious population born at the same instant will live, 0, 1, 2, &c., years and has been used for two main purposes. The first, to provide a basis for commercial transactions, to make it possible to buy and sell equitably life annuities, assurances upon lives, and other similar conditional payments; the second to effect a summary and graphic comparison between the states of mortality in different communities or different occupations. In *medical research*, in the sense in which most of this audience understand that term, it has been used by very few. In England, my friend, Dr. John Brownlee,[4] is perhaps the only medical man who has devoted close attention to its possibilities as an instrument of research. I am aware that Bardolph was not thought a good security for Falstaff, so I shall not dwell, as I should like to do, upon the researches of a fellow medical statistician but call a witness from the respectable and unstatistical pages of the *Zeitschrift für Allgemeine Physiologie*. In 1921, August Pütter,[5] of Bonn, published an essay in which he argued that the immense literature dealing with the physiology and pathology of the duration of life, a literature to which such men as Weismann and Rubner have contributed, suffers from the lack of any clear idea as to what really is being investigated. He observes that we know more about the course of life in man than in any other animal, and suggests that it would be just as well to start by learning what there is to be learned from life-tables.

Pütter brings to the subject a fresh mind, and, like an intelligent man, sets his imagination to work to discover a *law* of mortality—i.e., some mental shorthand which will describe the increase of mortality with age. He is interested in the physiological problem of senescence, and so he only considers increasing mortality—i.e., from adult age onwards. As a laboratory worker would naturally do, he first takes the analogy of the destruction of bacteria by a disinfectant and considers the law of decrement which describes that case, the logarithmic law, the expression of the waning of a population opposing a constant power of resistance to a constant force of destruction. He suggests the combination with this of a law of geometrically increasing destructive power, so the law of human mortality he finally reaches is compounded of two factors, (1) which measures a

as a youth; perhaps as candid an account of my present position as unconscious vanity will allow me to make will help others to assess fairly the value of the statistical method.

The General Case Against Medical Statistics.

It is generally agreed that statistics of a sort are useful to the medical profession; that, for instance, it is desirable to compute and publish death-rates and records of infectious diseases. But many research workers would deny that data of this kind either ever have been made or ever could be made the subject of a scientific investigation apt to reveal new and important truths, in the sense that the data of experiment can be made to disclose the secrets of nature. Let me try to state the grounds of such an opinion as forcibly as I can.

The medical statistics of any country can, at best, only reflect the opinions of its practitioners of medicine; at worst, they may be a mere translation into figures of the hearsay of laymen, possibly of drunken and venal old women—Graunt's view of the sources of vital statistics in the seventeenth century. Medical statistics between the best and the worst—that is to say, as they are compiled in most civilised countries—record not all the candid opinions of certifying practitioners, but some of their opinions. So long as medical practice is individualistic and death certificates are open to the inspection of the friends of the deceased—as they are in England and Wales—there is some motive to refrain from recording any opinion which may either hurt the credit of the practitioner in the eyes of his clients or do violence to common human sentiments. To subject documents of this order of accuracy to elaborate mathematical manipulation is surely trifling. "How and why did this man die?" is the most tremendous of interrogatories. To answer it fairly and fully may require knowledge and insight which no man has ever had, not Hippocrates, not Sydenham. Our medical statistics are the coding of answers given not by Hippocrates and Sydenham, but by men of only ordinary ability and insight, some ignorant, some biassed. "Dix millions d'ignorances," said Taine, "ne font pas un savoir." No calculus will transmute a million inaccurate verbal statements into an exact numerical appraisement. Can we deduce from this codification of half-truths anything at all which we might not have reached by plain good sense and observation without arithmetic? The Registrar-General tells us that 44,789 persons died of "influenza" in 1919, 112,310 in 1918, and only 7283 in 1917. We needed no statistics to convince us that "influenza" was a great pestilence in 1918, a serious cause of illness in 1919, and relatively unimportant in 1917. The Registrar-General does, indeed, tell us many things we did not know. He says that 29,777 persons were reported to have died of "old age" in 1919, and that four of these ancients were between 45 and 50, 14 between 50 and 55, and 59 between 55 and 60. We also learn from him that "old age" was epidemic in 1909; 33,975 people succumbed to it in that year, but it was much less virulent in 1913 when only 29,801 were cut off. Certainly we did not know these facts until the Registrar-General told us of them; indeed, we do not know them now. Putting it bluntly, what is true in his records is not new to any observant man, and what is new is probably not true. That, I think, is a fair statement of the objections many feel but few express, because, nowadays, statisticians, even medical statisticians, are quite respectable people. Now let us see whether the objection can be met, and met upon ground which is as unfavourable as can well be chosen—viz., the ground of the seventeenth century.

Graunt and Sydenham.

Contemporaneously in London in the seventeenth century two men endeavoured to elucidate the natural history of disease. Each used the same figure of speech and supported it with the same authority. The one averred that "The Observations which I happened to make (for I designed them not) upon the Bills of Mortality, have fallen out to be both Political and Natural, some concerning Trade and Government, others concerning the Air, Countries, Seasons, Fruitfulness, Health, Diseases, Longevity, and the proportions between the Sex and Ages of Mankind. All which (because Sir Francis Bacon reckons his Discourses of Life and Death to be Natural History . . .) I am humbly bold to think Natural History also, and consequently that I am obliged to cast in this small Mite into your great Treasury of that kind."[1] The other, desiderated, "primo Historia, sive morborum omnium descriptio quoad fieri potest graphica et naturalis," and said that, done so that "evitetur censura quam clarissimus Verulamius in nonnullos ejusmodi promissores vibravit," it would be a task not easy of fulfilment.[2]

One of the two was a London tradesman, John Graunt, the other, Thomas Sydenham, *medicus in omne ævum nobilis*. One based his natural history upon tables of figures compiled from the reports of "ancient matrons" whose diagnostic powers were, he thought, affected by the "mist of a cup of Ale and the bribe of a two-groat fee." The other's data were his own careful observations through 20 years of practice in the capital.

Given two men so equipped for the discovery of truth, which was the likelier to find truth, to make known natural historical facts apt to stimulate further research and so lead to further discoveries? Surely the answer is, Sydenham. But if we were to select from the host of natural historical facts of mortality, a fact *now* trite enough, but a novelty 200 years ago, one fact which has inspired more sanitary effort and more laboratory investigation than perhaps any other, it would be, I think, the enormous excess of mortality in childhood in large cities. One of our two natural historians of disease revealed that fact. He said: "We shall find that about 36 *per centum* of all quick conceptions died before six years old." . . . "When I consider, that in the Country 70 are born for 58 buried, and that before the year 1600 the like happened in London, I considered, whether a city as it becomes more populous, doth not, for that very cause, become more unhealthful: and inclined to believe, that London now is more unhealthful than heretofore; partly for that it is more populous, but chiefly because I have heard, that 60 years ago few Sea Coals were burnt in London, which are now universally used."

These are the words not of Sydenham but of Graunt, and how "the observations which I happened to make" led, directly and immediately, to the foundation of scientific methods of life assurance and, indirectly, to the establishment of those national registers of life and death, without which the work of Simon, of Chadwick, of Buchanan, of Power, and of Shirley Murphy could never have been done, is an oft-told tale. To "the observations which I happened to make" may be traced the inspiration of bacteriological researches carried out by men who never heard the name of Graunt.

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Is it a fact that a man of good sense can be trusted to interpret statistical data without either special training or (as in Graunt's case) special ability? In 1801 Dr. William Heberden the Younger published "Observations on the Increase and Decrease of Different Diseases." Heberden was something more than a mere man of good sense; he was a scholar, an experienced physician, and had family interest in medico-statistical investigations. His father, one of the most famous of eighteenth century physicians, financed a continuation of Graunt's work by Corbyn Morris. Heberden, then, went over the ground fairly acquainted with his predecessor's work and reached a conclusion which attracted a good deal of attention; he said, "there is scarcely any fact to be collected from the bills of mortality more worthy the attention of physicians than the gradual decline of dysentery." Heberden took together the three titles, bloody flux, colic, and griping in the guts, he showed that the annual average was more than 1000 in the first decade of the eighteenth century, fell to 770, to 700, to 350, 150, 110, 80, 70, 40, and finally 20 in the decade 1790–1800. He attributed this decline to greater cleanliness and better ventilation. But, as Creighton pointed out,[2] Heberden had simply made a statistical mistake; he had supposed "griping in the guts" to be dysentery when it really meant infantile diarrhœa; he made this mistake by overlooking the age-incidence of the deaths assigned to griping in the guts and did not notice that the total had been gradually transferred to the rubric convulsions. He *did* notice that the numbers assigned to convulsions had increased, but explained it by the transfer to this heading of chrisomes and infants, but did *not* remark (*a*) that transfer had been made already while convulsions were still a small total, (*b*) the gross total of chrisomes and infants was never large enough to make a difference of the required order of magnitude. If you compare Heberden's treatment of this case with Graunt's treatment of the question of whether rickets were a "new disease" in or about 1634, I think you will have no difficulty in deciding that Graunt did have a critical faculty which is really something more than simple good sense, and that a very sensible man like Heberden may blunder badly.

It would be easy enough to mention examples more recent than that of Heberden. Such mistakes look very foolish *when they are pointed out;* but a dozen of them will be made by very intelligent men within a year. I think we may accept the proposition that there is a kind of statistical tact, which is rather more than simple good sense; some are born with it, like Graunt; the rest of us have to acquire it. The second point raised by my objector is worth more consideration.

I wish to consider it under two subdivisions—first, when we confine the scope of the statistical method to what Graunt modestly called his shop arithmetic or to developments of that shop arithmetic which would have been quite intelligible to him; secondly, when we bring into the account a modern calculus which would have been almost as hard for Graunt to understand as it is for many, even laboratory workers, in the twentieth century.

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I choose as an example under the first heading the case of life-tables. Graunt made the first life-table, and the difference between the last English life-table, with its serried ranks of numerals, and the few figures of Graunt is of detail, very important detail of course, not of principle. A life-table purports to tell us how many of a fictitious population born at the same instant will live, 0, 1, 2, &c., years and has been used for two main purposes. The first, to provide a basis for commercial transactions, to make it possible to buy and sell equitably life annuities, assurances upon lives, and other similar conditional payments; the second to effect a summary and graphic comparison between the states of mortality in different communities or different occupations. In *medical research*, in the sense in which most of this audience understand that term, it has been used by very few. In England, my friend, Dr. John Brownlee,[4] is perhaps the only medical man who has devoted close attention to its possibilities as an instrument of research. I am aware that Bardolph was not thought a good security for Falstaff, so I shall not dwell, as I should like to do, upon the researches of a fellow medical statistician but call a witness from the respectable and unstatistical pages of the *Zeitschrift für Allgemeine Physiologie.* In 1921, August Pütter,[5] of Bonn, published an essay in which he argued that the immense literature dealing with the physiology and pathology of the duration of life, a literature to which such men as Weismann and Rubner have contributed, suffers from the lack of any clear idea as to what really is being investigated. He observes that we know more about the course of life in man than in any other animal, and suggests that it would be just as well to start by learning what there is to be learned from life-tables.

Pütter brings to the subject a fresh mind, and, like an intelligent man, sets his imagination to work to discover a *law* of mortality—i.e., some mental shorthand which will describe the increase of mortality with age. He is interested in the physiological problem of senescence, and so he only considers increasing mortality—i.e., from adult age onwards. As a laboratory worker would naturally do, he first takes the analogy of the destruction of bacteria by a disinfectant and considers the law of decrement which describes that case, the logarithmic law, the expression of the waning of a population opposing a constant power of resistance to a constant force of destruction. He suggests the combination with this of a law of geometrically increasing destructive power, so the law of human mortality he finally reaches is compounded of two factors, (1) which measures a

as a youth; perhaps as candid an account of my present position as unconscious vanity will allow me to make will help others to assess fairly the value of the statistical method.

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It is generally agreed that statistics of a sort are useful to the medical profession; that, for instance, it is desirable to compute and publish death-rates and records of infectious diseases. But many research workers would deny that data of this kind either ever have been made or ever could be made the subject of a scientific investigation apt to reveal new and important truths, in the sense that the data of experiment can be made to disclose the secrets of nature. Let me try to state the grounds of such an opinion as forcibly as I can.

The medical statistics of any country can, at best, only reflect the opinions of its practitioners of medicine; at worst, they may be a mere translation into figures of the hearsay of laymen, possibly of drunken and venal old women—Graunt's view of the sources of vital statistics in the seventeenth century. Medical statistics between the best and the worst—that is to say, as they are compiled in most civilised countries—record not all the candid opinions of certifying practitioners, but some of their opinions. So long as medical practice is individualistic and death certificates are open to the inspection of the friends of the deceased—as they are in England and Wales—there is some motive to refrain from recording any opinion which may either hurt the credit of the practitioner in the eyes of his clients or do violence to common human sentiments. To subject documents of this order of accuracy to elaborate mathematical manipulation is surely trifling. "How and why did this man die?" is the most tremendous of interrogatories. To answer it fairly and fully may require knowledge and insight which no man has ever had, not Hippocrates, not Sydenham. Our medical statistics are the coding of answers given not by Hippocrates and Sydenham, but by men of only ordinary ability and insight, some ignorant, some biassed. "Dix millions d'ignorances," said Taine, "ne font pas un savoir." No calculus will transmute a million inaccurate verbal statements into an exact numerical appraisement. Can we deduce from this codification of half-truths anything at all which we might not have reached by plain good sense and observation without arithmetic? The Registrar-General tells us that 44,789 persons died of "influenza" in 1919, 112,310 in 1918, and only 7283 in 1917. We needed no statistics to convince us that "influenza" was a great pestilence in 1918, a serious cause of illness in 1919, and relatively unimportant in 1917. The Registrar-General does, indeed, tell us many things we did not know. He says that 29,777 persons were reported to have died of "old age" in 1919, and that four of these ancients were between 45 and 50, 14 between 50 and 55, and 59 between 55 and 60. We also learn from him that "old age" was epidemic in 1909; 33,975 people succumbed to it in that year, but it was much less virulent in 1913 when only 29,801 were cut off. Certainly we did not know these facts until the Registrar-General told us of them; indeed, we do not know them now. Putting it bluntly, what is true in his records is not new to any observant man, and what is new is probably not true. That, I think, is a fair statement of the objections many feel but few express, because, nowadays, statisticians, even medical statisticians, are quite respectable people. Now let us see whether the objection can be met, and met upon ground which is as unfavourable as can well be chosen—viz., the ground of the seventeenth century.

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Contemporaneously in London in the seventeenth century two men endeavoured to elucidate the natural history of disease. Each used the same figure of speech and supported it with the same authority. The one averred that "The Observations which I happened to make (for I designed them not) upon the Bills of Mortality, have fallen out to be both Political and Natural, some concerning Trade and Government, others concerning the Air, Countries, Seasons, Fruitfulness, Health, Diseases, Longevity, and the proportions between the Sex and Ages of Mankind. All which (because Sir Francis Bacon reckons his Discourses of Life and Death to be Natural History . . . .) I am humbly bold to think Natural History also, and consequently that I am obliged to cast in this small Mite into your great Treasury of that kind."[1] The other, desiderated, "primo Historia, sive morborum omnium descriptio quoad fieri potest graphica et naturalis," and said that, done so that "evitetur censura quam clarissimus Verulamius in nonnullos ejusmodi promissores vibravit," it would be a task not easy of fulfilment.[2]

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Sydenham was the high man, if you please, and Graunt the low man, but what he sought to do he did do. It is fine to have a soul above mere shop arithmetic, but perhaps unless one does cloak the humanity of one's patients in the guise of mere ciphers and averages, flesh and blood will be too much for us and our interest in the individual happenings

searching out of nature; the equivalent of technique in the mathematical sciences is *notation*, and the history of knowledge has shown that the discovery of a good notation is so important that, with a good notation a second-rate man may go further into the arcana of nature than a first-rate man can penetrate with a bad notation. Now the *notation* of the life-table is exceedingly good. One proof of that assertion is that the notation used in seemingly unrelated cases will help us to discovery. I may be permitted to give a trivial example. During the war there was a good deal of concern over the wastage of labour in munition factories, very wild statements were made as to the numbers of new hands it was necessary to engage in order to maintain a constant strength of workers, and as to the effect of various measures in increasing or diminishing the rate of loss. I was instructed to investigate the subject and thought that one might liken entrance to and exit from a factory to birth and death, and construct factory survival tables formally and notationally analogous to life survival tables.[8] Having once got the idea, its application was simple if laborious, and we not only solved the problem originally proposed—viz., to determine the actual rates of wastage and the effects upon such wastage of changing the environmental conditions—but we were able to show that when, as happened at one time, the output of munitions of a particular type exceeded the demand, there was no need either for dramatic discharges or curtailment of hours, that if merely the industrial birth-rate were reduced to zero by refraining from the engagement of new hands, the population would be reduced to the required dimensions by the operation of the industrial "death-rate" in such-and-such a time. By the application of the life-table method it was quite easy to solve what appeared to be an extremely complicated problem.

This is a trivial illustration; reference to the papers of Prof. W. W. C. Topley[9] suggests far more important applications. This is, indeed, the point to which I have been bringing you by devious paths. I said at the outset that my conception of the statistical method in medicine has changed in the last 20 years; this is especially so with regard to the bearing of statistical method upon experiment. I used to see in the statistician the critic of the laboratory worker; it is a rôle which is gratifying to youthful vanity, for it is so easy to cheat oneself into the belief that the critic has some intellectual superiority over the criticised. I do not think even now that statistical criticism of laboratory investigations is useless, but I attach enormously more value to direct collaboration, the making of statistical experiments, and the permeation of statistical research with the experimental spirit. In this matter Prof. Topley is the pioneer. Topley has endeavoured to study *under laboratory conditions* the genesis and development of epidemics. Down to his time the subject has been examined in absolutely isolated fields. We have had on the one hand historians, public health administrators, statisticians wholly occupied with the records of occurrences of epidemic disease in nature; we have had on the other laboratory workers sedulously investigating the biological properties of the *materies morbi* and searching out the immunological properties of the living tissues of men and other animals. Between these two groups there has been little coöperation, the sanitarians have often drawn on themselves the contempt of the trained laboratory worker by a certain rashness and even amateurishness in their exploitation of laboratory results; the laboratory workers have sometimes displayed an equal crudity in their interpretations of the facts of sanitary history. It has not been recognised that the complex of phenomena in the world of humanity is so vast and the accuracy of the historical record so poor that there is little hope of solving any epidemic problem by the statistical or historical analysis of records alone; there is equally little hope of solving it by the minutely accurate, small scale experiment which has been the fashion of the laboratory worker. We must observe a "population" less complex, less exposed to the play of varied influences than the world of men and women, but much more complex than any laboratory investigator before Topley and the staff of the Rockefeller Institute had dreamed of. But, from the moment that we envisage the possibility of studying an artificial epidemic, we are faced with the need of much greater knowledge of the physiology of the animals we shall use as our material, and of a notation to describe the results.

Topley has worked with populations of mice and has reached such tentative conclusions as these:—

> "We were thus forced to the conclusion that mice, among which an epidemic was spreading, were subjected to an increased risk of death if they were allowed to mingle with normal members of their own species. This conclusion was confirmed by measuring the rate of extinction of a mouse population, among which a given bacterial disease was spreading, according as it was kept in isolation or was subject to a steady immigration of susceptible individuals of the same species. . . . It would seem, then, that the survivors from one epidemic, though in apparent health, are carrying the parasites which caused the disease from which their companions died, and that when they come into contact with any considerable number of susceptible individuals of their own species a process is set up which leads to a fresh outbreak of disease. It seems clear also that these mice which have passed through one epidemic wave are now possessed of some increased powers of resistance to the disease in question, for they tend regularly to outlive the new arrivals in the cage. But this resistance is relative and not absolute, for they tend to die during the later stages of the new epidemic which they themselves have started. . . . We are led to the view that the immigration of healthy but susceptible individuals into a population which has recently emerged from a considerable outbreak of disease is just as dangerous to the community they enter as it is to themselves" (op. cit., pp. 65–68).

Topley reaches these conclusions by treating his data on the lines of a life or survival table; it is evidently the proper way to treat them. Before we can fully profit by experimental studies of epidemics we must learn much more about the course of life, apart from epidemics, in our population. While "laboratory animals" are only used as living culture media or animated test-tubes, people have not bothered about their sociology! In Rössle's[10] vast *referat* on *Wachstum und Altern* one seeks in vain for *any* precise observations of the course of life in animals other than man. He cannot go beyond the cautious conclusion that in such animals as have been "tolerably" (leidlich) studied one finds "a uniform decay of many organs and tissues" rather than a senile central nervous system in a young body (op. cit., p. 569). We have a survival table for one animal other than man—*Drosophila melanogaster!*—made by Prof. Raymond Pearl[11] (*Metron*, 1923, ii., 697).

We know very little of the trend of life in mice. Yet this is important. Prof. Pearl suggests that we can make an exact comparison between the life-table of a fly and the life-table of a human population by merely altering the unit; one year of human life is equated to 1·1279 days in the life of a fly. Suppose we take the common opinion that the average life of a mouse is two years, then a year of human life is equivalent, taking an average human life as 50 years, to about a fortnight, so by that method of reckoning an attack of, say, mouse typhoid ending in recovery is a matter of (humanly speaking) years. We know what a different business, say, a pneumococcal pneumonia is between 40 and 50 and between 20 and 30 from the prognostic standpoint. We have not sufficiently considered the possibility that this factor may be of importance in populations of laboratory animals. We *must* consider this and many other histological factors on statistical lines, with the notation of the life-table and Graunt's shop arithmetic. Such is my answer to the first part of the second question proposed so long ago that you have forgotten it. Using no statistical methods which would not have been intelligible to John Graunt, applying those methods to the controlled populations handled by Topley, it is probable, it is almost certain, that we constantly acting force, his *Vernichtungsfaktor,* (2) the other measures the increasing lability of the tissues and is the *Alternsfaktor*. He shows that the mere arithmetical average called the expectation of life or mean duration of life in any population must be a function of both these factors, but notes that it is only the second which is of importance in the physiological study of senescence. After displaying some arithmetical examples of his proposed formulæ, he writes: "These reflections suffice to make it clear that physiology has no use for the statistical concept of the mean after life-time, but that, on the other hand, from precisely the same data from which statistics draw the concept of a mean after life-time, that is, from the mortality or survival table, physiology can deduce an important concept, the concept of a factor of senescence" (op. cit., p. 25).

As I said at the beginning we are all vain, and it is hard, even for physiologists, to believe that their thoughts had passed through the minds of dead men who were perhaps not even physiologists. Pütter's idea *may* have occurred to de Moivre or one of the Bernouillis (most good statistical ideas have), and it was at least clearly and fully expressed 99 years ago by Benjamin Gompertz[6] who held "it possible that death may be the consequence of two generally coexisting causes; the one chance, without previous disposition to death or deterioration, the other a deterioration, or increased inability to withstand destruction." Gompertz had in mind a law of mortality to express both factors, although he actually proposed one only covering the second—Pütter's *Alternsfaktor*—and a formula, including both a *Vernichtungsfaktor* and an *Alternsfaktor*, was introduced into actuarial practice only 65 years ago by Makeham, and is now termed the Makeham-Gompertz law. It differs in technical detail—for the better—from Pütter's formula, but it seeks to embody precisely the same idea. But although the idea of Pütter, or Gompertz, has been public property for nearly a century, no *physiological* use has been made of it, save by Dr. Brownlee. Dr. Brownlee has pointed out the significance of the formula from the physico-chemical point of view, and made it the basis of reflections which I am too ignorant of physical chemistry to appraise. I have looked at it from a much humbler standing-point. My line of thought was this. Suppose one accepts the suggestion that mortality is fully determined by two factors in Pütter or Gompertz's sense, then are they sufficiently separated by the Gompertz-Makeham "law" for any useful comparison of the strength of the forces at different epochs to be possible? In a general way we know that the environmental conditions of this generation are more favourable than those of our great grandfathers, that many causes of death and illness which were powerful in the eighteenth century are now almost negligible; typhus is extinct, typhoid obsolescent, tuberculosis greatly less fatal than 100 years ago. The death-rate of 1924 will probably not be as much as 50 per cent. of that of 1774. But it does not follow that the natural rate of tissue senescence has changed; that if the environment were perfect men of our generation would live longer than men of the eighteenth century placed under ideal conditions would have lived.

Let us see whether we can test this by the life-table method. The earliest life-table for an English population which is suitable for comparison is that known as the Carlisle table, and was based upon the mortality of part of Carlisle in the years 1779–87; the most recent national table is English Life Table, No. 8, based on the mortality of 1910–12. The Makeham-Gompertz constants of these tables have been calculated, those of the Carlisle table long ago, those for English Life Table, No. 8, by Mr. Trachtenberg,[7] and if we compare the values of the *Vernichtungsfaktoren* in the two tables we find that of the Carlisle table no less than three times as large as that of English Life Table, No. 8. Now let us see how long life would have been under each experience had the *Vernichtungsfaktor* been obliterated. By the nature of the assumed law of senescence, a geometrical rate of increasing destruction. there is no point of age at which *all* will be dead; theoretically some of Mr. Shaw's immortals exist, but we may calculate the age at which the original population will be reduced to one-thousandth or one-millionth, or any desired fraction of its initial number. I find, then, that the age at which only one in a million of those who lived to be 20 would still be alive supposing only the *Alternsfaktor* operative is for the Carlisle experience 105·8 years. For the England and Wales (Makehamised) experience of 1910–12 it is 104·7 years—that is, almost the same. I repeated the experiment on the English Life Table, No. 5, experience of 1881–90 as Makehamised by Mr. Trachtenberg; this table has a *Vernichtungsfaktor* greater by 78 per cent. than that of 1910–12, but the *Alternsfaktor* is again sensibly equal to the others, the one in a million survival age, when the *Vernichtungsfaktor* is abolished is 105·2 years. I made a similar comparison of the national Swedish life-tables for the experiences of 1816–40 and 1901–10 (I obtained the Makeham-Gompertz constants by a rough but sufficiently accurate approximation). The change in the *Vernichtungsfaktor* was not so great, a difference of 21 per cent., but it was considerable, the ages of survival on the stated hypotheses were 104·7 years and 105·5 years. Having reached this point and having further noted the fact that the general run of the *Vernichtungsfakoren* for the Swedish life-tables (eight of which are available) is concordant with the fluctuations of the public health of that country through the nineteenth century, I might be tempted to assert categorically that by a study of life-tables one can (*a*) deduce the quantitative measure of improvement in environmental conditions; (*b*) conclude that the physiological rate of senescence is invariable and that the human span of existence is under no circumstances whatever likely to exceed 110 years. But a little wider induction shows how foolish such a statement would be. Returning again to Mr. Trachtenberg's useful collection of Makehamised tables, we note that although what I have called the *Vernichtungsfaktor* is usually smaller the more favourable the general mortality, it is not always so. Thus he has computed the constants for the 1911–12 experience of London, of the county boroughs, of the urban districts, and of the rural districts. In this series the lowest *Vernichtungsfaktor* is that of London, the highest that of the rural districts, 156 per cent. of the value for London. But London's mortality was not so favourable as that of the rural districts; the mean after life-time at age 20 was 47·08 years on the rural experience, 42·35 years on that of London, and, of course, no sensible person would believe that the general environmental conditions of the rural districts are half as bad again as those of London. There are, at least, two reasons for this discrepancy. The first, that the so-called law only approximates crudely to the description of the natural facts; the second, that we have not got the "facts." These life-tables are not, what some people still seem to think them, records of the way in which men have really died; they are records of the way in which men would have died had they been subjected to conditions to which no real men ever have been simultaneously subjected. The English life-table for the "experience" of 1901–10 does not record the way in which the males of England and Wales died in 1901–10, but the way a hypothetical population would have died out had it been subjected to the *average* forces of mortality prevalent in that epoch. This artefact possibly, indeed probably, does not differ very widely from the truth, only attainable if we had a life card for every person born—a perfectly attainable ideal. But it would not be very sensible to spend much ingenuity in inventing more complex mathematical "laws" of mortality for the sake of representing more closely such data. But even with our crude mathematical hypothesis and our imperfect material we have gained something—viz., a new point of view, and from that new point we see various possibilities of research. Sir Almroth Wright has spoken of the profound importance of a good technique in the searching out of nature; the equivalent of technique in the mathematical sciences is *notation*, and the history of knowledge has shown that the discovery of a good notation is so important that, with a good notation a second-rate man may go further into the arcana of nature than a first-rate man can penetrate with a bad notation. Now the *notation* of the life-table is exceedingly good. One proof of that assertion is that the notation used in seemingly unrelated cases will help us to discovery. I may be permitted to give a trivial example. 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The New Statistical Calculus.

The second part of my question, what we are to hope from the new statistical calculus, I have left no time to answer fairly. I will only quote from an old book. Oesterlen[12] said:—

> "It may be regarded as the established result of experience that scrofula, rachitis, the formation of tubercles, and similar affections, occur most frequently in the children of the poor. Statistical indications of the same circumstance are also not wanting, but our insight into its immediate or remote causes is not furthered by them because they merely give us a certain total result, and do not enlighten us, for instance, as to whether those children fell sick from bad food and air, or from want of care, from hereditary predisposition, from bodily malformations, or from a syphilitic taint derived from their parents. All this we may hope to learn with more certainty as statistical comparison becomes more accurate and is better able to isolate some particular influence and determine its action upon any given case."

Oesterlen's prevision has been fulfilled. Even the most convinced adherents of the environmental as opposed to the genetic origin of ill-health will hardly deny that, for instance, Prof. Karl Pearson's investigations of the factors influencing the ill-being or well-being of children have given us a clearer insight into the rôles of different possible and probable causes of ill-health. Nature *does* present us with skeins not to be unravelled by the most habile experimenter, cases where the A, the B, and C *cannot* be studied in isolation. In these instances, the modern statistical calculus of correlations is, not indeed a key to all the mythologies, but a useful, an invaluable, tool.

As the immediate collaborator of the experimenter, collaboration implying that he will take pains to understand the work of the experimenter, even to do some of it himself, the medical statistician has, I submit, an important part to play in modern research. In the investigation of such phenomena as are, at first view, too complex for experimentation, he can do service, chiefly, I believe, in detecting by his calculus factors which might be made the object of a simpler but more exact experimental investigation. When I first took an interest in these matters, more than 20 years ago, there was some tendency to treat the statistician or biometrician as a pariah, and he acquired the virtues and vices of a minority, a certain courage and a certain trick of over-emphasis —they always characterise a fighting minority. Now, statistics and statisticians are perfectly respectable; there may even be a risk of putting the claims of the statistical expert too high. The time may perhaps come when a brilliant young mathematician, building higher on the mathematical foundations laid by Karl Pearson, will assert that in medical, or any other biological research, the judgment of the biometrician must be final; he must be the ultimate court of appeal. If that time comes, I shall be found enlisted under the banner of Sir Almroth Wright, and shall quote to the would-be dictator the words of Macaulay:—

> "I tell the honourable and learned gentleman, that the same spirit which sustained us in a just contest for him will *sustain us in an equally just contest against him.* Calumny, abuse, royal displeasure, popular fury, exclusion from office, exclusion from Parliament, we were ready to endure them all, rather than that he should be less than a British subject. We never will *suffer him to be more.*"

The statistician must be the equal not the predominant partner.

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OBSERVATIONS ON THE USE OF INSULIN.

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Insulin is employed in diabetes with the object of making good a deficiency in the supply of the natural hormone of the pancreas in these cases. The ideal method of administering the drug would be to imitate as closely as possible the normal supply of the substance in the body. Unfortunately we are ignorant of the rate of secretion of insulin by the pancreas and whether the process is continuous or intermittent. It would seem probable, however, that a small quantity of the hormone is constantly being poured out, and that an extra amount becomes available when required, for example, after a carbohydrate meal has been taken. In any case the supply of insulin in normal individuals is such that the blood-sugar remains about 0·1 per cent. and is only raised to a slight extent by ingested carbohydrates. Diabetic subjects respond to carbohydrate food less perfectly, the lack of insulin allowing a much greater and much more prolonged increase in the blood-sugar, the percentage often rising to 0·3 or 0·4. The mildest cases of the disease show this exaggerated hyperglycæmia only after feeding, and their blood-sugar may return to the normal level between meals and during the night. In such patients a sample of blood taken before breakfast will give a normal reading. When the case is more severe, the phase of hyperglycæmia persists longer after each meal and may not pass off completely during the night. The fasting blood-sugar level is therefore high, and glycosuria is present during the whole 24 hours. Such a patient starts his day with a handicap; the blood-sugar, which already stands above the renal threshold, is further raised by each meal, and does not have time to subside far before the next food is taken. It will be seen, then, that the morning blood-sugar value represents the lowest point in the daily cycle in such cases, and when the patient is on a standard diet, the height of the fasting sugar level gives a rough guide to the severity of the case *at the moment.*

Effect of Diet on Fasting Blood-sugar.

The character of the diet that the patient is taking is also a factor in determining the height of his fasting blood-sugar. When he passes from a more meagre to a larger diet, the level of the fasting blood-sugar gradually rises from day to day until a new equilibrium is reached. The full effect may not be evident for some days after the food increase has been made. In the same way reduction of the food intake lowers the fasting sugar levels, a principle that has been made use of in the well-known Allen system. Again, the new level only becomes definitely established after a certain interval. Some patients become sugar-free on slight restriction of diet, others must be deprived of food for two or three days before the blood-sugar falls below the renal threshold level. From this it follows that the state of the blood-sugar and the quantity of sugar lost by the kidney only correspond to the food intake when the patient has been on a constant diet for several days. This fact serves to explain the frequent failure to find a relationship between the food intake and the degree of glycosuria.

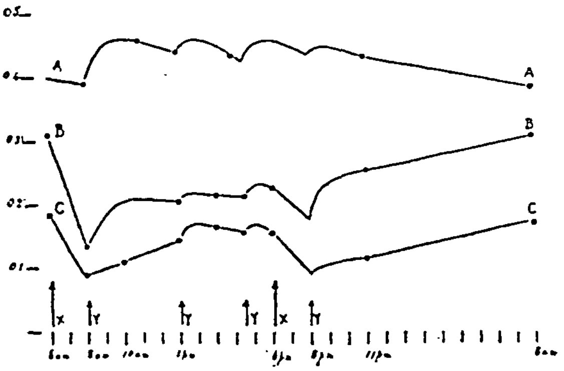
The slow change to a new level is doubtless due to liberation of stored carbohydrate.

The following figures, obtained from a moderately severe case of diabetes, give an idea of the fluctuation in blood-sugar values throughout the day:—

Observation	A	B	C	D	E	F
Hours	0	3	5	8	15	24
Sugar per cent. ..	0·39	0·50	0·44	0·43	0·43	0·38

A is the fasting blood-sugar reading taken at 8 A.M.; B was taken three hours after breakfast and should represent the maximum rise of the post-prandial curve. C and D were taken immediately before dinner and tea respectively. E was taken four hours after supper, and F is the fasting level next morning. The rises after dinner, tea, and supper were not observed but have been guessed at. (See Curve A, Fig. 1.)

FIG. 1.—*To show Changes in Blood-sugar Levels during 26 Hours.*



Ordinates show percentage of blood-sugar, Abscissæ hours. Insulin given to Cases B and C at 6 A.M. and 6 P.M. Case A received no insulin. Meals taken at points Y. Actual observations indicated by dots.

High blood-sugars of this sort lead to considerable waste of carbohydrate by glycosuria, and are also known to aggravate the pancreatic damage. It is therefore desirable to employ insulin in such a manner as to maintain the blood-sugar about the normal level at all times. How best to do this has not been decided.

Effect of a Single Dose of Insulin in a Diabetic Subject.

Insulin given subcutaneously to a fasting patient causes a somewhat slow fall in the blood-sugar during the first half hour. This phase is followed by a much more rapid decline for the next hour or hour and a half, but after the second hour the rate of fall again slows and only a slight further diminution in concentration takes place, although the effect persists for a long time. The minimum point is reached somewhere between the third and the sixth hours, and thereafter the blood-sugar values increase once more. A return to the original fasting level would take place were not the diminishing effect of several hours of starvation superadded. The whole reaction caused by 10 units of insulin lasts more than eight hours, and in many cases the effects are still noticeable 12 to 16 hours after injection.

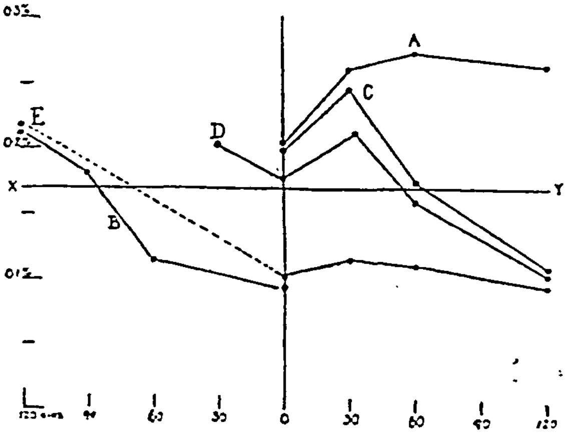
The absorption and the utilisation of insulin is an example of "consecutive reactions" (as has been shown for adrenalin).[1] The rate of removal of the insulin from the site of injection is most rapid at first, when the greatest amount of the drug is present locally, and diminishes later. The amount of the substance in the blood will rise from zero to a maximum concentration, and during this period an increasing effect (blood-sugar fall) will take place. The slow preliminary decline in the blood-sugar values means that a certain time is required for the greater part of the insulin to come into action. Attention should be given to this point in determining the interval between the injection of the drug and the giving of the food it is designed to "cover." Although the quantity of insulin administered may theoretically account for the amount of carbohydrate taken, the rate of absorption of the food might outstrip that of the drug and so upset the calculation. Clinical experience has shown that other factors must be taken into account.

Effect of Varying the Interval between the Administration of Insulin and the Taking of Food.

Little attention seems hitherto to have been given to this question, which appears to be of some importance. When a diabetic takes carbohydrate food his blood-sugar almost at once begins to increase, and rises rapidly to a considerable height. We have seen, however, that the full effect of insulin is not obtained until some half-hour or more after the injection has been given. It will therefore appear that a considerable rise of blood-sugar may take place before sufficient insulin is available to arrest the increase. During this interval glycosuria may occur even when the fasting sugar level has been normal. When the morning blood-sugar is high, as so frequently is the case in these subjects during the early stages of treatment, this loss of sugar in the urine may be of great importance. Even when the amount of carbohydrate and the quantity of insulin were so perfectly matched as to neutralise each other and the reaction commenced from a high fasting level, the subsequent blood-sugar value would still remain above the renal threshold throughout the whole absorption period, and much glucose would be lost. The use of larger doses of insulin might overcome these difficulties by hastening absorption of the drug, but this would add greatly to the expense of treatment.

Observations have been made on the blood-sugar changes and on the urine in patients taking a standard breakfast with a uniform dose of insulin *at different intervals* before the meal. The results are shown in Fig. 2. The breakfast when taken without insulin causes the typical excessive rise in blood-sugar (Curve A). If insulin is given and food is taken immediately afterwards the blood-sugar rises for a time, then falls again fairly abruptly, much earlier

FIG 2.—*To show Effect of Varying the Interval between Injection of Insulin and the Meal Following.*



A standard breakfast was given at the point 0: the figures on the abscissæ indicate minutes before and after commencing the meal.

Curve A, blood-sugar changes when no insulin was given. B, Effect of 10 units of insulin on the fasting blood-sugar. C, Breakfast and insulin taken at same time. D, Insulin given half hour before food. E, Insulin two hours before breakfast. X–Y, Normal level of renal threshold.

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[1] Lees, D. M.: The Absorption of Adrenalin, Jour. Exp. Med., xxxviii., [illegible]

shall reach a clearer insight into the phenomena of epidemic disease than generations of unintegrated experimental and statistical work have achieved; armed with that knowledge, we may be able to interpret the record, both minute and defective, of human history.

THE NEW STATISTICAL CALCULUS.

The second part of my question, what we are to hope from the new statistical calculus, I have left no time to answer fairly. I will only quote from an old book. Oesterlen[12] said:—

> "It may be regarded as the established result of experience that scrofula, rachitis, the formation of tubercles, and similar affections, occur most frequently in the children of the poor. Statistical indications of the same circumstance are also not wanting, but our insight into its immediate or remote causes is not furthered by them because they merely give us a certain total result, and do not enlighten us, for instance, as to whether those children fell sick from bad food and air, or from want of care, from hereditary predisposition, from bodily malformations, or from a syphilitic taint derived from their parents. All this we may hope to learn with more certainty as statistical comparison becomes more accurate and is better able to isolate some particular influence and determine its action upon any given case."

Oesterlen's prevision has been fulfilled. Even the most convinced adherents of the environmental as opposed to the genetic origin of ill-health will hardly deny that, for instance, Prof. Karl Pearson's investigations of the factors influencing the ill-being or well-being of children have given us a clearer insight into the rôles of different possible and probable causes of ill-health. Nature *does* present us with skeins not to be unravelled by the most habile experimenter, cases where the A, the B, and C *cannot* be studied in isolation. In these instances, the modern statistical calculus of correlations is, not indeed a key to all the mythologies, but a useful, an invaluable, tool.

As the immediate collaborator of the experimenter, collaboration implying that he will take pains to understand the work of the experimenter, even to do some of it himself, the medical statistician has, I submit, an important part to play in modern research. In the investigation of such phenomena as are, at first view, too complex for experimentation, he can do service, chiefly, I believe, in detecting by his calculus factors which might be made the object of a simpler but more exact experimental investigation. When I first took an interest in these matters, more than 20 years ago, there was some tendency to treat the statistician or biometrician as a pariah, and he acquired the virtues and vices of a minority, a certain courage and a certain trick of over-emphasis—they always characterise a fighting minority. Now, statistics and statisticians are perfectly respectable; there may even be a risk of putting the claims of the statistical expert too high. The time may perhaps come when a brilliant young mathematician, building higher on the mathematical foundations laid by Karl Pearson, will assert that in medical, or any other biological research, the judgment of the biometrician must be final; he must be the ultimate court of appeal. If that time comes, I shall be found enlisted under the banner of Sir Almroth Wright, and shall quote to the would-be dictator the words of Macaulay:—

> "I tell the honourable and learned gentleman, that the same spirit which sustained us in a just contest for him will sustain us in an equally just contest against him. Calumny, abuse, royal displeasure, popular fury, exclusion from office, exclusion from Parliament, we were ready to endure them all, rather than that he should be less than a British subject. We never will suffer him to be more."

The statistician must be the equal not the predominant partner.

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OBSERVATIONS ON THE USE OF INSULIN.

BY D. MURRAY LYON, M.D., F.R.C.P. EDIN.,
CHRISTISON PROFESSOR OF THERAPEUTICS, UNIVERSITY OF EDINBURGH.

INSULIN is employed in diabetes with the object of making good a deficiency in the supply of the natural hormone of the pancreas in these cases. The ideal method of administering the drug would be to imitate as closely as possible the normal supply of the substance in the body. Unfortunately we are ignorant of the rate of secretion of insulin by the pancreas and whether the process is continuous or intermittent. It would seem probable, however, that a small quantity of the hormone is constantly being poured out, and that an extra amount becomes available when required, for example, after a carbohydrate meal has been taken. In any case the supply of insulin in normal individuals is such that the blood-sugar remains about 0·1 per cent. and is only raised to a slight extent by ingested carbohydrates. Diabetic subjects respond to carbohydrate food less perfectly, the lack of insulin allowing a much greater and much more prolonged increase in the blood-sugar, the percentage often rising to 0·3 or 0·4. The mildest cases of the disease show this exaggerated hyperglycæmia only after feeding, and their blood-sugar may return to the normal level between meals and during the night. In such patients a sample of blood taken before breakfast will give a normal reading. When the case is more severe, the phase of hyperglycæmia persists longer after each meal and may not pass off completely during the night. The fasting blood-sugar level is therefore high, and glycosuria is present during the whole 24 hours. Such a patient starts his day with a handicap; the blood-sugar, which already stands above the renal threshold, is further raised by each meal, and does not have time to subside far before the next food is taken. It will be seen, then, that the morning blood-sugar value represents the lowest point in the daily cycle in such cases, and when the patient is on a standard diet, the height of the fasting sugar level gives a rough guide to the severity of the case *at the moment.*

Effect of Diet on Fasting Blood-sugar.

The character of the diet that the patient is taking is also a factor in determining the height of his fasting blood-sugar. When he passes from a more meagre to a larger diet, the level of the fasting blood-sugar gradually rises from day to day until a new equilibrium is reached. The full effect may not be evident for some days after the food increase has been made. In the same way reduction of the food intake lowers the fasting sugar levels, a principle that has been made use of in the well-known Allen system. Again, the new level only becomes definitely established after a certain interval. Some patients become sugar-free on slight restriction of diet, others must be deprived of food for two or three days before the blood-sugar falls below the renal threshold level. From this it follows that the state of the blood-sugar and the quantity of sugar lost by the kidney only correspond to the food intake when the patient has been on a constant diet for several days. This fact serves to explain the frequent failure to find a relationship between the food intake and the degree of glycosuria.

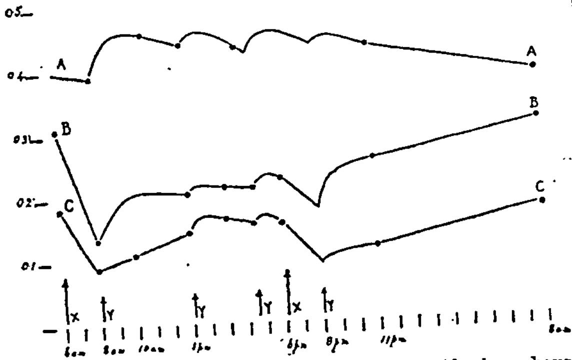
The slow change to a new level is doubtless due to liberation of stored carbohydrate.

The following figures, obtained from a moderately severe case of diabetes, give an idea of the fluctuation in blood-sugar values throughout the day:—

Observation	A	B	C	D	E	F
Hours	0	3	5	8	15	24
Sugar per cent. ..	0·39	0·50	0·44	0·43	0·43	0·38

A is the fasting blood-sugar reading taken at 8 A.M.; B was taken three hours after breakfast and should represent the maximum rise of the post-prandial curve. C and D were taken immediately before dinner and tea respectively. E was taken four hours after supper, and F is the fasting level next morning. The rises after dinner, tea, and supper were not observed but have been guessed at. (See Curve A, Fig. 1.)

FIG. 1.—*To show Changes in Blood-sugar Levels during 26 Hours.*



Ordinates show percentage of blood-sugar, Abscissæ hours. Insulin given to Cases B and C at 6 A.M. and 6 P.M. Case A received no insulin. Meals taken at points Y. Actual observations indicated by dots.

High blood-sugars of this sort lead to considerable waste of carbohydrate by glycosuria, and are also known to aggravate the pancreatic damage. It is therefore desirable to employ insulin in such a manner as to maintain the blood-sugar about the normal level at all times. How best to do this has not been decided.

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Observations have been made on the blood-sugar changes and on the urine in patients taking a standard breakfast with a uniform dose of insulin *at different intervals* before the meal. The results are shown in Fig. 2. The breakfast when taken without insulin causes the typical excessive rise in blood-sugar (Curve A). If insulin is given and food is taken immediately afterwards the blood-sugar rises for a time, then falls again fairly abruptly, much earlier

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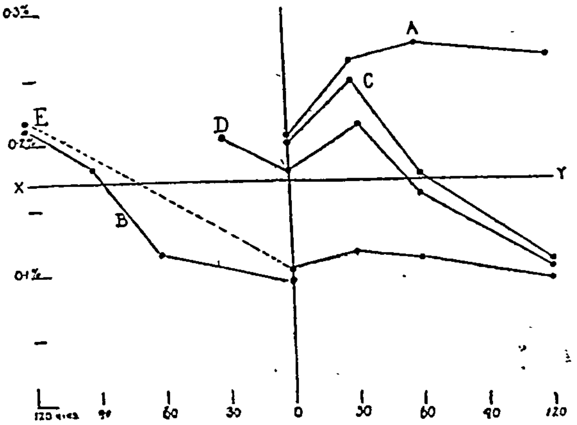

A standard breakfast was given at the point 0; the figures on the abscissæ indicate minutes before and after commencing the meal.

Curve A, blood-sugar changes when no insulin was given. B, Effect of 10 units of insulin on the fasting blood-sugar. C, Breakfast and insulin taken at same time. D, Insulin given half hour before food. E, Insulin two hours before breakfast. X–Y, Normal level of renal threshold.

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[1] Lyon, D. M.: The Absorption of Adrenalin, Jour. Exp. Med., xxxviii., 655.

than it would if no insulin were given (Curve C). The fall often continues to a point well below the initial level, the actual degree of reduction depending on the original height of the blood-sugar, the amount of carbohydrate in the meal, and the dose of insulin employed. If an interval of half an hour is allowed the blood-sugar during that period diminishes slightly before the food is taken; a small temporary rise then takes place, to be followed by a greater and more persistent fall (Curve D). The effect of the carbohydrate intake on the blood-sugar is now less than in the former case, but the level may still rise above the renal threshold for a short time.

If a comparatively large dose of insulin is given immediately before a meal, or even half an hour before it, it is possible for glycosuria to occur during the temporary phase of raised blood-sugar, and for symptoms of hypoglycæmia to appear a short time afterwards during the subsequent fall of the blood-sugar. This occurrence of glycosuria in a patient who has regular attacks of hypoglycæmia is rather puzzling at first sight, but a thorough understanding of the blood-sugar changes readily explains it, and the matter can be easily adjusted by balancing the diet and the dose of insulin. When there is a space of two hours between food and insulin conditions are different. This interval is sufficient to permit the insulin to reduce the blood-sugar to within normal limits before the meal is given. The same quantity of food as was formerly taken now produces only a very slight and short-lived rise which does not reach the renal threshold, and the whole reaction indeed closely resembles that which would be produced in a healthy individual (Curve E). No sugar escapes and all the food is made use of.

For the past six months it has been our practice to employ an interval of about two hours between each dose of insulin and the meal which follows. By this plan glycosuria is avoided and the patient is able to make the fullest use of the insulin given. It was thought that although the two-hour interval was the most satisfactory to employ in the morning before breakfast when the fasting blood-sugar required to be brought down to the normal level, a shorter period between dose and meal might be sufficient throughout the day. When the point was investigated, however, it was found that shorter intervals at these times were less satisfactory than the two-hour period. If only half an hour was allowed the dose of insulin had to be increased to produce the same effect. For these reasons it is claimed that the maximum value of the drug is obtained—that is, the largest quantity of food can be "covered" by a definite quantity of insulin—if a period of about two hours elapses before food is taken. This becomes a very important consideration in severe cases of the disease when the amount of the drug available has to be limited because of the expense. A word of caution, however, is necessary at this point.

It has occasionally been found in very severe cases of diabetes of long-standing that on commencing treatment the first doses of insulin given two hours before food are followed by rather severe symptoms of hypoglycæmia, but that a few days later, under apparently the same conditions, no attack occurs. In explanation of this it is suggested that the effect of the insulin does not depend on the height of the blood-sugar alone, but also to some extent on the glycogen content of the tissues. The view has been taken that insulin creates in the tissues a vacuum for glucose. In these severe cases of long standing the tissues contain very little or no glycogen, and under insulin they are able to take in rapidly a very large proportion of the sugar circulating in the blood so that hypoglycæmia is easily induced within two hours. A few days later, when the glycogen content of the tissues has improved, the transference of glucose into them under the same dose of insulin is much less rapid and no symptoms occur in the two-hour period. It would therefore be desirable in *emaciated subjects*, when commencing the use of insulin, to allow an interval of only half an hour between the dose and the meal following for the first three days and thereafter to lengthen the interval to two hours as recommended above. As a matter of fact, cases of this type when first applying for treatment commonly show clinical evidence of acidosis, and attention is directed to treatment of this condition by pushing the carbohydrate intake and neglecting for the time the degree of glycosuria.

How Should the Daily Supply of Insulin be Distributed?

The object to be aimed at in employing insulin is to keep the blood-sugar within normal limits, not only during the digesting periods, but throughout the *whole 24 hours*. How can this be best accomplished?

The total quantity of insulin available may be given as one dose or may be broken up into several equal or unequal fractions to be taken over the day. The suitability of any one method depends to a great extent on the amount of the drug to be employed. Where the total quantity is small (5 or 10 units) it may be given as a single dose, but this method is unsuitable for injections of over 20 units. On the other hand, there are obvious objections to giving a large number of small doses in the day, although this plan would probably more closely follow the natural supply. It is usually found most convenient to divide the insulin into two or three portions. Large doses are much more liable to give rise to hypoglycæmia than smaller ones, so that even when a large morning dose of insulin is followed by a breakfast rich in carbohydrate an attack may be experienced before dinner-time. When all the insulin is given at one time the distribution of the food is less satisfactory, for the later meals in the day must be rather poor in carbohydrate. It is probable, too, that the effect of the single large dose of insulin on the blood-sugar will have worn off 24 hours after the injection. Equal fractions of the total daily supply are usually employed at each injection, but sometimes it seemed preferable to give a slightly larger dose in the morning before breakfast.

The action of the insulin on the blood-sugar can be followed in two ways, (*a*) by making frequent estimations of the blood-sugar, (*b*) by examining each quantity of urine passed. The former method is doubtless more accurate, but is distasteful to the patient and can only be carried out in well-equipped hospitals. Blood-sugar examinations are now no longer done as a routine for the purpose of controlling the patient's food intake. The second plan has a much wider application, and may even be undertaken by the patient himself. It consists in examining two-hourly specimens of urine from 6 A.M. to 10 P.M. and a collected sample for the hours of sleep. This method readily shows whether each meal is adequately covered, or whether it is too rich in carbohydrate, and correction of the food distribution then becomes an easy matter. Such urine examinations are of especial service when a patient who is taking insulin passes only a very small quantity of sugar in the twenty-four hours. Apart from those glycosurias due to toxæmia or to nerve hypertonus, traces of sugar in a sample of mixed urine for the whole day are either caused by the carbohydrate at one or other meal being in excess, or by the effect of the insulin wearing off during the night. Frequent sampling will show at once where the leak occurs.

When two or three doses of insulin are given during the day-time within a space of about eight hours (say from 8 A.M. to 4 P.M.) the influence of the last dose has disappeared long before morning, so that the blood-sugar values creep up during the night, and glycosuria occurs before breakfast. There seems to be a constant tendency for the blood-sugar in the diabetic to return to a high level after it has been lowered by insulin and when presumably all the "extra" mobilised sugar has been stored away. From this it might be inferred that the organism, lacking the normal quantity of insulin, is best able to make use of the glucose when it stands at this high level in

the blood. It may be that the greater concentration, or the greater head of pressure of the sugar, facilitates the transference from the blood-stream into the tissues—a mass action effect. When insulin is supplied, the sugar can be satisfactorily dealt with at a much lower pressure.

Early morning glycosuria proved very troublesome in certain cases until steps were taken to control the blood-sugar during the night as well as in the daytime. This was accomplished by separating the first and the last doses of insulin as widely as possible, allowing not more than 12 hours between the evening dose and the morning one. If the carbohydrate is fairly divided between the "protected" meals there is no danger of an attack of hypoglycæmia during sleep, since the after-supper increase of blood-sugar fills up the lowest part of the evening insulin curve. The presence of a third dose during the day does not affect the position of the other two doses. Failure to control the blood-sugar during the night leads to a high fasting blood-sugar in the morning, so that the patient begins his day at a disadvantage.

Frequent blood-sugar examinations in a series of insulin cases have helped to explain what happens. The following points were chosen for sampling: (A) Fasting level before insulin ; (B) minimum value two hours after insulin and immediately before breakfast ; (C) two hours after breakfast—to catch the height of the post-prandial curve ; (D) level just before dinner ; (E) maximum after dinner ; (F) minimum before tea ; (G) level before evening insulin ; (H) value at 11 P.M. ; (I) fasting level next morning. Meals were given at 8 A.M., 1 P.M., 4.30 P.M., and 8 P.M., the carbohydrate being principally in the breakfast and the supper, and insulin was injected at 6 A.M. and at 6 P.M. The results are shown in the following table (see also curves B and C in Fig. 1)

Table Showing Results of Blood-sugar Examinations in Insulin Cases.

—	A (*a*)	B (*b*)	C	D (c)	E	F (*d*)	G (*e*) (*f*)	H	I
	6 A.M.	8 A.M.	10 A.M.	1 P.M.	3 P.M.	4.30 P.M.	6 P.M.	11 P.M.	8 A.M.
1	0·31	0·13	—	0·20	0·21	—	0·23	0·25	0·30
2	0·29	0·19	—	0·12	0·22	—	0·22	0·22	0·29
3	0·31	0·16	0·12	0·08	—	—	0·22	0·22	0·31
4	0·24	0·13	—	0·16	—	0·23	0·20	0·10	0·20
5	0·19	0·11	—	0·15	—	0·14	0·15	0·14	0·19
6	0·19	0·09	0·11	0·15	0·17	0·14	0·14	0·12	0·17
7	0·24	0·17	0·17	0·13	—	—	0·20	0·20	0·24

(*a*) Insulin, 6 A.M.
(*b*) Breakfast, 8 A.M.
(*c*) Dinner, 1.15 P.M.
(*d*) Tea, 4.30 P.M.
(*e*) Insulin, 6 P.M.
(*f*) Supper, 8 P.M.

In all cases the highest readings in the 24 hours are the morning fasting values, and when the diet is constant these figures tally fairly closely from day to day. Cases 1, 2, 3, and 4 were examined early in their course of treatment, and showed some sugar in the morning urine specimens. In the case of No. 4 the carbohydrate was arranged for three doses of insulin, but by an oversight the mid-day injection was omitted. This accounts for the very high figures in the afternoon, but the evening dose corrected the hyperglycæmia and the patient started the night with a very low reading.

A valid objection to the control of diet by urine examination alone is that the absence of glycosuria only indicates that the blood-sugar is being kept *below the patient's renal threshold*, and this level in diabetics is often in the neighbourhood of 0·20 per cent. or even 0·25 per cent. Allen's experiments in depancreatised dogs showed that continued hyperglycæmia caused further degeneration of the damaged islets of Langerhans, and clinical experience has amply confirmed this. Patients with persistent hyperglycæmia and glycosuria continue to go downhill, but in such cases the blood-sugar remains above the renal threshold. It is possible, however, that in long-standing diabetes the pancreas and other tissues, as well as the kidneys, have become acclimatised to work best when the blood-sugar level is slightly higher than normal, and that this slightly greater concentration does not lead to the same bad results in them. It may, of course, be simply a matter of degree. Certainly those patients whose diets are controlled by urine examinations alone show marked improvement as treatment proceeds. It has seldom been necessary to give moderately severe cases more than 25 to 30 units of insulin a day to keep them sugar free, to allow them to reach a satisfactory maintenance diet, and to enable them to put on considerable weight. Further, after the same diet has been continued for a time it is usually found that the fasting blood-sugar levels fall still lower and often become normal, while at the same time the dose of insulin required may be reduced to 15 or 10 units. Some fortunate individuals have been able to dispense with the insulin altogether before they left hospital. It would seem probable, therefore, that damage to the pancreas does not follow if the blood-sugar concentration is kept below the level of the renal threshold.

Significance of Fasting Blood-sugar Values.

It was pointed out above that alterations in the level of the fasting blood-sugar from day to day tend to lag behind the changes in diet which produce them. This is seen in two ways. An unexpected return of glycosuria may occur when a patient has been for some days on a fixed diet with a constant amount of insulin. The balance of food intake and insulin dosage appears to be satisfactory and no sugar is lost for two or three days. Then without alteration of either food or insulin the 24 hours specimen of urine will one day give a faint cloud with Fehling's solution. Next day it gives an olive-green colour when tested, and the day after a definite orange. These slighter changes in the urine-Fehling mixture are of considerable importance and are looked upon as the earliest sign that a return of glycosuria is threatened. Certainly, if no reduction of the diet is made on discovering such changes, definite sugar appears within 24 or 48 hours. This gradual return of sugar in the urine has been taken to mean that the amount of food eaten was a little too high for the quantity of insulin given, and has thus led to a slow rise in the fasting blood-sugar level from day to day until the renal threshold was passed and glycosuria became evident. Such a reappearance of a positive reaction with Fehling's solution is most likely to occur when the patient has left hospital and is trying to take as high a maintenance diet as possible in order to allow him to work. The return of sugar in the urine is always a disappointment to the patient, and should be avoided if possible. It is a good plan to insist on such a patient taking a lower diet once a week. Instead of his usual 2500 or 2800 calorie diet he drops for one day to 1200 or 1500 calories, at the same time continuing his insulin as usual. If hypoglycæmia threatens on such a low day the reduction in food is not necessary and the low day may be discontinued. The introduction of a half-ration day definitely reduces the fasting blood-sugar level and prevents it from ever reaching or surpassing the renal threshold.

The lag effect is also seen in the opposite direction. In certain cases, as treatment advances, the patient begins to find that he experiences slight symptoms of hypoglycæmia—hunger, slight flushing, perspiration, or shakiness—about 1¼ or 1¾ hours after the insulin has been injected. These symptoms may also appear for the first time after the patient has apparently been stabilised on a definite food-insulin balance for several days without having attacks. In this case the insulin is more than sufficient the purpose intended. The appearance of slight signs of hypoglycæmia indicates that the sugar has fallen to about 0·7 per cent. or low probably implies that the original morning level was normal or only slightly elevat patients before leaving hospital are recognise the signs of hypoglycæmia and h

than it would if no insulin were given (Curve C). The fall often continues to a point well below the initial level, the actual degree of reduction depending on the original height of the blood-sugar, the amount of carbohydrate in the meal, and the dose of insulin employed. If an interval of half an hour is allowed the blood-sugar during that period diminishes slightly before the food is taken; a small temporary rise then takes place, to be followed by a greater and more persistent fall (Curve D). The effect of the carbohydrate intake on the blood-sugar is now less than in the former case, but the level may still rise above the renal threshold for a short time.

If a comparatively large dose of insulin is given immediately before a meal, or even half an hour before it, it is possible for glycosuria to occur during the temporary phase of raised blood-sugar, and for symptoms of hypoglycæmia to appear a short time afterwards during the subsequent fall of the blood-sugar. This occurrence of glycosuria in a patient who has regular attacks of hypoglycæmia is rather puzzling at first sight, but a thorough understanding of the blood-sugar changes readily explains it, and the matter can be easily adjusted by balancing the diet and the dose of insulin. When there is a space of two hours between food and insulin conditions are different. This interval is sufficient to permit the insulin to reduce the blood-sugar to within normal limits before the meal is given. The same quantity of food as was formerly taken now produces only a very slight and short-lived rise which does not reach the renal threshold, and the whole reaction indeed closely resembles that which would be produced in a healthy individual (Curve E). No sugar escapes and all the food is made use of.

For the past six months it has been our practice to employ an interval of about two hours between each dose of insulin and the meal which follows. By this plan glycosuria is avoided and the patient is able to make the fullest use of the insulin given. It was thought that although the two-hour interval was the most satisfactory to employ in the morning before breakfast when the fasting blood-sugar required to be brought down to the normal level, a shorter period between dose and meal might be sufficient throughout the day. When the point was investigated, however, it was found that shorter intervals at these times were less satisfactory than the two-hour period. If only half an hour was allowed the dose of insulin had to be increased to produce the same effect. For these reasons it is claimed that the maximum value of the drug is obtained—that is, the largest quantity of food can be "covered" by a definite quantity of insulin—if a period of about two hours elapses before food is taken. This becomes a very important consideration in severe cases of the disease when the amount of the drug available has to be limited because of the expense. A word of caution, however, is necessary at this point.

It has occasionally been found in very severe cases of diabetes of long-standing that on commencing treatment the first doses of insulin given two hours before food are followed by rather severe symptoms of hypoglycæmia, but that a few days later, under apparently the same conditions, no attack occurs. In explanation of this it is suggested that the effect of the insulin does not depend on the height of the blood-sugar alone, but also to some extent on the glycogen content of the tissues. The view has been taken that insulin creates in the tissues a vacuum for glucose. In these severe cases of long standing the tissues contain very little or no glycogen, and under insulin they are able to take in rapidly a very large proportion of the sugar circulating in the blood so that hypoglycæmia is easily induced within two hours. A few days later, when the glycogen content of the tissues has improved, the transference of glucose into them under the same dose of insulin is much less rapid and no symptoms occur in the two-hour period. It would therefore be desirable in *emaciated subjects*, when commencing the use of insulin, to allow an interval of only half an hour between the dose and the meal following for the first three days and thereafter to lengthen the interval to two hours as recommended above. As a matter of fact, cases of this type when first applying for treatment commonly show clinical evidence of acidosis, and attention is directed to treatment of this condition by pushing the carbohydrate intake and neglecting for the time the degree of glycosuria.

How Should the Daily Supply of Insulin be Distributed?

The object to be aimed at in employing insulin is to keep the blood-sugar within normal limits, not only during the digesting periods, but throughout the *whole 24 hours*. How can this be best accomplished?

The total quantity of insulin available may be given as one dose or may be broken up into several equal or unequal fractions to be taken over the day. The suitability of any one method depends to a great extent on the amount of the drug to be employed. Where the total quantity is small (5 or 10 units) it may be given as a single dose, but this method is unsuitable for injections of over 20 units. On the other hand, there are obvious objections to giving a large number of small doses in the day, although this plan would probably more closely follow the natural supply. It is usually found most convenient to divide the insulin into two or three portions. Large doses are much more liable to give rise to hypoglycæmia than smaller ones, so that even when a large morning dose of insulin is followed by a breakfast rich in carbohydrate an attack may be experienced before dinner-time. When all the insulin is given at one time the distribution of the food is less satisfactory, for the later meals in the day must be rather poor in carbohydrate. It is probable, too, that the effect of the single large dose of insulin on the blood-sugar will have worn off 24 hours after the injection. Equal fractions of the total daily supply are usually employed at each injection, but sometimes it seemed preferable to give a slightly larger dose in the morning before breakfast.

The action of the insulin on the blood-sugar can be followed in two ways, (*a*) by making frequent estimations of the blood-sugar, (*b*) by examining each quantity of urine passed. The former method is doubtless more accurate, but is distasteful to the patient and can only be carried out in well-equipped hospitals. Blood-sugar examinations are now no longer done as a routine for the purpose of controlling the patient's food intake. The second plan has a much wider application, and may even be undertaken by the patient himself. It consists in examining two-hourly specimens of urine from 6 A.M. to 10 P.M. and a collected sample for the hours of sleep. This method readily shows whether each meal is adequately covered, or whether it is too rich in carbohydrate, and correction of the food distribution then becomes an easy matter. Such urine examinations are of especial service when a patient who is taking insulin passes only a very small quantity of sugar in the twenty-four hours. Apart from those glycosurias due to toxæmia or to nerve hypertonus, traces of sugar in a sample of mixed urine for the whole day are either caused by the carbohydrate at one or other meal being in excess, or by the effect of the insulin wearing off during the night. Frequent sampling will show at once where the leak occurs.

When two or three doses of insulin are given during the day-time within a space of about eight hours (say from 8 A.M. to 4 P.M.) the influence of the last dose has disappeared long before morning, so that the blood-sugar values creep up during the night, and glycosuria occurs before breakfast. There seems to be a constant tendency for the blood-sugar in the diabetic to return to a high level after it has been lowered by insulin and when presumably all the "extra" mobilised sugar has been stored away. From this it might be inferred that the organism, lacking the normal quantity of insulin, is best able to make use of the glucose when it stands at this high level in

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Early morning glycosuria proved very troublesome n certain cases until steps were taken to control the blood-sugar during the night as well as in the daytime. This was accomplished by separating the first and the last doses of insulin as widely as possible, allowing not more than 12 hours between the evening dose and the morning one. If the carbohydrate is fairly divided between the "protected" meals there is no danger of an attack of hypoglycæmia during sleep, since the after-supper increase of blood-sugar fills up the lowest part of the evening insulin curve. The presence of a third dose during the day does not affect the position of the other two doses. Failure to control the blood-sugar during the night leads to a high fasting blood-sugar in the morning, so that the patient begins his day at a disadvantage.

Frequent blood-sugar examinations in a series of insulin cases have helped to explain what happens. The following points were chosen for sampling: (A) Fasting level before insulin; (B) minimum value two hours after insulin and immediately before breakfast; (C) two hours after breakfast—to catch the height of the post-prandial curve; (D) level just before dinner; (E) maximum after dinner; (F) minimum before tea; (G) level before evening insulin; (H) value at 11 P.M.; (I) fasting level next morning. Meals were given at 8 A.M., 1 P.M., 4.30 P.M., and 8 P.M., the carbohydrate being principally in the breakfast and the supper, and insulin was injected at 6 A.M. and at 6 P.M. The results are shown in the following table (see also curves B and C in Fig. 1)

Table Showing Results of Blood-sugar Examinations in Insulin Cases.

—	A (*a*)	B (*b*)	C	D (*c*)	E	F (*d*)	G (*e*) (*f*)	H	I
	6 A.M.	8 A.M.	10 A.M.	1 P.M.	3 P.M.	4.30 P.M.	6 P.M.	11 P.M.	8 A.M.
1	0·31	0·13	—	0·20	0·21	—	0·23	0·25	0·30
2	0·29	0·19	—	0·12	0·22	—	0·22	0·22	0·29
3	0·31	0·16	0·12	0·08	—	—	0·22	0·22	0·31
4	0·24	0·13	—	0·16	—	0·23	0·20	0·10	0·20
5	0·19	0·11	—	0·15	—	0·14	0·15	0·14	0·19
6	0·19	0·09	0·11	0·15	0·17	0·14	0·14	0·12	0·17
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(*a*) Insulin, 6 A.M.
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(*c*) Dinner, 1.15 P.M.
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(*e*) Insulin, 6 P.M.
(*f*) Supper, 8 P.M.

In all cases the highest readings in the 24 hours are the morning fasting values, and when the diet is constant these figures tally fairly closely from day to day. Cases 1, 2, 3, and 4 were examined early in their course of treatment, and showed some sugar in the morning urine specimens. In the case of No. 4 the carbohydrate was arranged for three doses of insulin, but by an oversight the mid-day injection was omitted. This accounts for the very high figures in the afternoon, but the evening dose corrected the hyperglycæmia and the patient started the night with a very low reading.

A valid objection to the control of diet by urine examination alone is that the absence of glycosuria only indicates that the blood-sugar is being kept *below the patient's renal threshold*, and this level in diabetics is often in the neighbourhood of 0·20 per cent. or even 0·25 per cent. Allen's experiments in depancreatised dogs showed that continued hyperglycæmia caused further degeneration of the damaged islets of Langerhans, and clinical experience has amply confirmed this. Patients with persistent hyperglycæmia and glycosuria continue to go downhill, but in such cases the blood-sugar remains above the renal threshold. It is possible, however, that in long-standing diabetes the pancreas and other tissues, as well as the kidneys, have become acclimatised to work best when the blood-sugar level is slightly higher than normal, and that this slightly greater concentration does not lead to the same bad results in them. It may, of course, be simply a matter of degree. Certainly those patients whose diets are controlled by urine examinations alone show marked improvement as treatment proceeds. It has seldom been necessary to give moderately severe cases more than 25 to 30 units of insulin a day to keep them sugar free, to allow them to reach a satisfactory maintenance diet, and to enable them to put on considerable weight. Further, after the same diet has been continued for a time it is usually found that the fasting blood-sugar levels fall still lower and often become normal, while at the same time the dose of insulin required may be reduced to 15 or 10 units. Some fortunate individuals have been able to dispense with the insulin altogether before they left hospital. It would seem probable, therefore, that damage to the pancreas does not follow if the blood-sugar concentration is kept below the level of the renal threshold.

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It was pointed out above that alterations in the level of the fasting blood-sugar from day to day tend to lag behind the changes in diet which produce them. This is seen in two ways. An unexpected return of glycosuria may occur when a patient has been for some days on a fixed diet with a constant amount of insulin. The balance of food intake and insulin dosage appears to be satisfactory and no sugar is lost for two or three days. Then without alteration of either food or insulin the 24 hours specimen of urine will one day give a faint cloud with Fehling's solution. Next day it gives an olive-green colour when tested, and the day after a definite orange. These slighter changes in the urine-Fehling mixture are of considerable importance and are looked upon as the earliest sign that a return of glycosuria is threatened. Certainly, if no reduction of the diet is made on discovering such changes, definite sugar appears within 24 or 48 hours. This gradual return of sugar in the urine has been taken to mean that the amount of food eaten was a little too high for the quantity of insulin given, and has thus led to a slow rise in the fasting blood-sugar level from day to day until the renal threshold was passed and glycosuria became evident. Such a reappearance of a positive reaction with Fehling's solution is most likely to occur when the patient has left hospital and is trying to take as high a maintenance diet as possible in order to allow him to work. The return of sugar in the urine is always a disappointment to the patient, and should be avoided if possible. It is a good plan to insist on such a patient taking a lower diet once a week. Instead of his usual 2500 or 2800 calorie diet he drops for one day to 1200 or 1500 calories, at the same time continuing his insulin as usual. If hypoglycæmia threatens on such a low day the reduction in food is not necessary and the low day may be discontinued. The introduction of a half-ration day definitely reduces the fasting blood-sugar level and prevents it from ever reaching or surpassing the renal threshold.

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For the past six months it has been our practice to employ an interval of about two hours between each dose of insulin and the meal which follows. By this plan glycosuria is avoided and the patient is able to make the fullest use of the insulin given. It was thought that although the two-hour interval was the most satisfactory to employ in the morning before breakfast when the fasting blood-sugar required to be brought down to the normal level, a shorter period between dose and meal might be sufficient throughout the day. When the point was investigated, however, it was found that shorter intervals at these times were less satisfactory than the two-hour period. If only half an hour was allowed the dose of insulin had to be increased to produce the same effect. For these reasons it is claimed that the maximum value of the drug is obtained—that is, the largest quantity of food can be "covered" by a definite quantity of insulin—if a period of about two hours elapses before food is taken. This becomes a very important consideration in severe cases of the disease when the amount of the drug available has to be limited because of the expense. A word of caution, however, is necessary at this point.

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The total quantity of insulin available may be given as one dose or may be broken up into several equal or unequal fractions to be taken over the day. The suitability of any one method depends to a great extent on the amount of the drug to be employed. Where the total quantity is small (5 or 10 units) it may be given as a single dose, but this method is unsuitable for injections of over 20 units. On the other hand, there are obvious objections to giving a large number of small doses in the day, although this plan would probably more closely follow the natural supply. It is usually found most convenient to divide the insulin into two or three portions. Large doses are much more liable to give rise to hypoglycæmia than smaller ones, so that even when a large morning dose of insulin is followed by a breakfast rich in carbohydrate an attack may be experienced before dinner-time. When all the insulin is given at one time the distribution of the food is less satisfactory, for the later meals in the day must be rather poor in carbohydrate. It is probable, too, that the effect of the single large dose of insulin on the blood-sugar will have worn off 24 hours after the injection. Equal fractions of the total daily supply are usually employed at each injection, but sometimes it seemed preferable to give a slightly larger dose in the morning before breakfast.

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SERVICEABLE AS GUIDES TO TREATMENT.

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AND

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DURING the past two years there have been exceptional facilities at Frimley for observing cases of artificial pneumothorax. In this paper we have analysed certain outstanding clinical phenomena occurring in these cases during treatment, and endeavoured to correlate them with the immediate results obtained, in the hope that by this means we might acquire some information that would guide us in the treatment of our cases. We mean by "treatment" in this paper the general conduct of these cases at a sanatorium apart from the actual artificial pneumothorax treatment. Our conclusions have no bearing on the question of the value of artificial pneumothorax treatment, nor on the question of the proper amounts of air to be used in, or the correct spacing of, refills.

The cases have been of all types, and no selection whatever has been made. In the larger number, 60 out of 75, the pneumothorax was induced at Brompton Hospital. These are all Group 2 or Group 3 (L.C.C. classification) cases. The majority have been cases done for choice, presenting the probability of a good result, but some, especially those induced at the Sanatorium, have been "last resort" cases. As this paper does not deal with "choice of case" or "suitability of treatment" or the results of artificial pneumothorax treatment *versus* any other form of treatment, these have all been classed together. The length of time between the induction of artificial pneumothorax and the commencement of exercise has been variable, and has, on the whole, been longer in those cases induced at Brompton Hospital than in those induced at the Sanatorium. The shortest time has been six days and the longest 285 days; the average time has been 106 days.

The cases are all drawn from the working classes, and, in laying down a course of treatment for them, it has to be borne in mind that, with very few exceptions, they have got to earn their own livings, the only alternative being the workhouse infirmary. Further, the length of time that can be devoted to treatment is limited to a certain extent by financial conditions. Although those who are under the care of the L.C.C. are given the most generous allowance of institutional treatment if there is the slightest chance of a favourable result yet there is a limit even to this. Other considerations such as the home finance, also have a great influence in L.C.C. cases, and more so when the patient or his family is bearing the cost of institutional treatment. This point has to be made clear, so that it may be obvious that in different circumstances the line of treatment adopted might be greatly modified.

DEFINITIONS.

For the proper reading of the following tables certain definitions are necessary.

Length of Treatment.—In all our calculations this has been taken from the time the patient started his first walking exercise up to the date of departure.

Classification.—The patients have been classified as to the immediate results of treatment as "much improved," "improved," "in statu quo," "worse," or "dead." As far as possible, this classification has been made absolute and not relative—that is to say, the initial condition of the patient has not been taken into account. Although a patient may have been saved from rapidly impending death by the induction of an artificial pneumothorax, unless he is discharged with practically no symptoms and fit to work he is not classified as "much improved."

"*Much Improved.*"—Practically free from symptoms. Apparently fit to work and earn a living. No pyrexia.

"*Improved.*"—Symptoms much ameliorated. Apparently fit to be up and about and to do light work. No pyrexia.

"*I.S.Q.*"—Symptoms still present. Apparently unfit to earn a living. Pyrexial or non-pyrexial.

"*Worse or Dead.*"—In this paper the I.S.Q., worse, and dead patients have been classified in one group labelled "worse."

Pyrexia.—A recorded mouth temperature during the day of over 99° F.

Relapse.—Any condition, whether accompanied by pyrexia or not, which has necessitated the patient stopping exercise and being put on "rest" for four days or more.

EXERCISE AND LABOUR.

Walking Exercise.—Grades of walking range from half to eight miles a day. To this must be added the exercise taken by the patient during his reaction hours—an amount that cannot be measured, and depending on the common-sense of the individual. In some cases this unmeasured exercise is excessive, and may be a great factor in controlling the apparent response to treatment.

Labour.—Work is done in two shifts of two hours each, but in some cases the second shift is only one and a half hours. It is divided roughly into five grades, but the actual work of each patient is considered separately, and two patients in the same grade may be doing very different amounts of work if measured in foot pounds. To this, again, has to be added exercise taken during recreation, with the same remarks as to its importance.

Grade 1: Carrying small baskets holding about 7 lb.

Grade 2: Carrying baskets holding about 14 lb. Light hoeing and weeding.

Grade 3: Carting, with three mates, using a light hand-cart. Hoeing and light digging with a small fork. Rolling, three men to a light roller.

Grade 4: Carting, with two mates, using same cart. Digging, using a medium fork. Cross-cut sawing. Mowing and rolling.

Grade 5: Digging and trenching, using full-size tools. Cross-cut sawing. Rolling and mowing.

The precision with which this form of treatment is carried out depends on the individual, but we hope that our numbers are sufficient to balance errors arising from personal inequalities in the performance of the work.

Nature and Incidence of Relapses in Relation to Immediate Results of Treatment.

As our definition shows, we have stretched the meaning of the word "relapse" to cover widely different conditions. It may mean, on the one hand, a definite set-back with exacerbation of the disease, or, on the other hand, a short cessation from exercise deemed necessary because of some slight, or even imaginary, clinical warning. The long relapses are of the first type, the shorter ones mainly of the second type. As might be expected, the probability of relapse varies inversely with the response to treatment, but our figures in Table I. show that the actual length of each relapse is of prognostic significance. This is found to be shortest in the "much-improved" class, and longest in the "worse" class, those in the "improved" class falling between the two. This fact is shown more clearly when viewed from a different standpoint, as is done in Table II. So that one can say that a long relapse denotes a bad prognosis. But, as will appear later, if that relapse is caused by the temporary disturbance of health coincident with the appearance of pleural fluid, although it may be of some length, it is not necessarily of bad prognostic significance.

The stage of exercise at which relapse occurs appears to be of extreme importance. Our findings are set forth in Table III., which shows that if a patient is able to reach a certain stage of walking exercise without relapse, he will probably be discharged as much improved; and even though relapses do occur in the much-improved class during the working period, it is obvious they must be very insignificant, and rest has been ordered more by way of a precautionary measure. If it is allowed, provided that other factors do not contradict it, that the best short an attack, so no harm results from the appearance of slight manifestations. When this stage of treatment is reached and the patient is experiencing slight attacks, several courses are open. The interval between the injection and the meal may be shortened. This avoids the appearance of the symptoms, and at the same time keeps the blood-sugar at a low level. Alternatively, the amount of food taken may be increased daily until the symptoms cease to appear; or thirdly, the diet may be kept constant while the dose of insulin is reduced. All these procedures have been followed as occasions warranted.

It has not yet been definitely decided whether in all cases an endeavour should be made to keep the fasting blood-sugar level as low as possible, or whether as good results are to be obtained by merely avoiding glycosuria. The former plan would seem to be preferable, at least for a time, during the earlier stages of treatment, but of course it requires larger doses of insulin. The question is often decided automatically by the economic situation, when it is necessary to obtain the maximum result with the smallest outlay.

Reliability of Commercial Insulin.

Considering that the only method at present available for the standardisation of insulin is a pharmacological assay of doubtful value, the uniformity of the strength of the insulin supplied is remarkable. It is rather easy to check the quality of a new sample on patients who have been under control for some time. As a rule, a definite dose of a fresh batch of the substance can be relied upon to "cover" as much carbohydrate as the last batch did. From time to time, however, sugar returns in the urine of "pedigreed" patients who have carefully followed out their usual régime. Were such instances isolated, it might be thought that the glycosuria was due to faulty dieting, intercurrent toxæmia, or passing nervous strain (worry, excitement, &c.) These failures, however, usually appear in groups, complaints being received from other wards and from out-patients who are using the same batch of the drug. Sometimes the strength appears to be little more than half the normal worth. Since errors may appear on the side of weakness, it is possible that some batches of insulin issued are over-strength. This fault would not be so readily detected, unless by the sudden occurrence of hypoglycæmia in cases where the fasting blood-sugar was being kept at a very low level. The tendency to occasional variability in the strength of the insulin must be kept in mind when an unexpected reappearance of glycosuria occurs.

THE TREATMENT OF TUBERCULOSIS WITH SODIUM MORRHUATE.

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A few years ago sodium morrhuate, a sodium salt of cod-liver oil, was introduced by Sir Leonard Rogers as a remedy for tuberculosis. I have found this remedy of great help in advanced cases, but not so successful as in the early ones, in whom it appears to lead to a complete arrest of the disease. It is easily administered by subcutaneous injection.

I usually begin with 0·5 c.cm., and if the reaction is only very slight, I proceed to a dose of 1 c.cm., administered twice weekly. There does not appear to be any advantage in using a larger dose. Sometimes a slight local reaction around the needle puncture is observed which is apt to occur if a month or so had elapsed since the last injection. It is used in a 3 per cent. solution obtainable in rubber-capped bottles. It is essential to let the bottle stand in warm water for a few minutes before use, when it should be clear and not the least muddy.

Descriptive Cases.

The following is an account of 11 patients treated by this method:—

Case 1.—Mr. J. T., aged 28 years, had been ill for six months previous to seeing me in June, 1919, shortly after he had had slight hæmoptysis. His evening temperature was 101·5° F. There was consolidation of the left apex, night-sweats, and T.B. in sputum. Weight on commencing treatment 9 st. 2 lb. In September, 1919, the night-sweats had ceased. He was feeling stronger, and the T.B. were less numerous in the sputum. His weight was then 9 st. 11 lb. In December, 1919, there was no T.B. in the sputum, no cough, and weight was 10 st. 7 lb.

This patient received 59 injections, using in all 56 c.cm. of sodium morrhuate. In 1920 he went to America and has been working there since then as a traveller.

Case 2.—Mr. A. C., aged 21. In January, 1920, he had consolidation of the right apex, dullness on percussion, and crepitations, night-sweats, and T.B. present in the sputum. Weight was 8 st. 11 lb. At the end of eight months' treatment no T.B. were found in the sputum, night-sweats had gone, and there were no crepitations. There was only slight dullness on percussion. His weight was now 9 st. 10 lb.

Case 3.—Mr. D. T., aged 18, consulted me in March, 1920. He had consolidation of the left base, crepitations, night sweats, cough, T.B. in the sputum. Weight 9 st. 3 lb. After six months' treatment he felt well, percussion only slightly dull, no crepitations, cough, or night-sweats. Weight 10 st. 4 lb.

Case 4.—Miss A. W., aged 20, had consolidation of the left apex, crepitations, with dullness on percussion. Evening temperature 101° F. She had T.B. in the sputum. At the end of six months' treatment the apex had cleared up, the crepitations were gone, and there were no T.B. in the sputum. Evening temperature normal. Weight increased from 7 st. 1½ lb. to 8 st. 3 lb.

Case 5.—Mr. J. H., aged 41. Consolidation right apex. T.B. present in sputum, crepitations, dullness on percussion. Weight 10 st. 9 lb. After six months' treatment the weight was 11 st. 6 lb. There were no T.B. in the sputum, no crepitations, and the percussion note was only slightly dull.

Case 6.—Mr. J. M., aged 25. Took ill in India where he had calcium injections. When I first saw him he had consolidation of the right apex. Two months afterwards the left base became affected. Patient stated he felt better after the injections and continued with them a long time, but he lost ground and died almost two years after coming home.

Case 7.—Mr. W. L., had been ill four months when he came to see me. Several of the family had died with tuberculosis. Three months after coming to see me he developed a cavity in the left apex. His illness ran a rapid course and he died in a few months. In this case the injections did not appear to have an appreciable effect on the disease.

The following cases were more advanced.

Case 8.—Mr. J. M., aged 19. Had tuberculosis of the bladder; pus, blood, and T.B. in the urine. Frequent micturition and losing flesh. Weight 6 st. 12 lb. Three months later the patient had gained 7 lb. and felt much better. At the end of seven months the urine contained no pus, blood, or T.B. The urine was passed only three or four times a day. Weight 8 st. 3 lb.

Case 9.—Mr. T. S., aged 32. Left apical cavity, tubercle of left vocal cord, T.B. in sputum. Three months after commencing treatment the lung dried up and the throat improved. The weight had risen from 9 st. 4½ lb. to 10 st. 3 lb. Eight months from commencement of treatment the throat was healed and there were no T.B. in the sputum. Patient avoided speaking as far as possible during that time.

Case 10.—Mr. P., aged 36. Had been unfit for work for two years, mostly confined to the house. The expectoration was purulent and contained T.B. There was a cavity at the left base. After six months' treatment the sputum was free from T.B. and the temperature was normal.

Case 11.—Boy, aged 14 years. Cavity left apex, T.B. in sputum. He did not react well to treatment. He stated, however, that he felt better after the injections, but unfortunately he lost ground and died after having been ill 14 months.

I consider that a review of these cases shows that we have in sodium morrhuate a valuable remedy for the treatment of tuberculosis, especially early cases.

Degree of Completeness of Collapse.

Table VII. shows that those patients with a complete collapse tend to do better than those with only a partial collapse. But it is possible that this result may not be due to the actual completeness of the collapse, but to the fact that in those cases in which a complete collapse has been obtained the disease before induction may have been less extensive than in those in which the collapse was only partial. These figures, therefore, cannot be used as an argument for dividing adhesions in pneumothorax cases in order to produce complete collapse—a question which does not come within the scope of this paper.

TABLE VII.

—	Complete collapse.	Partial collapse.
M.I.	51·4 per cent.	48·6 per cent.
I..	16·7 „	83·3 „
W.	14·3 „	85·7 „

Prognostic Importance of the Condition of the other Lung.

The question as to the extent and type of disease in the other lung in the presence of which it is permissible to induce an artificial pneumothorax is a very interesting one, but again does not come within our scope here. Our figures, however, in Table VIII. show that while bilateral disease is compatible with a good result in a large number of cases (37·9 per cent. of the "much improved" group had bilateral disease), yet its presence is against a good prognosis, as is shown by looking at the figures in a different way (Table VIII.A).

TABLE VIII. TABLE VIII.A.*

Patients.	Disease in other lung.	No disease in other lung.	Bilateral.	Unilateral.
	Per cent.	Per cent.	%	%
M.I.	37·9	62·1	14 (35)	23 (63·8)
I.	44·4	55·6	8 (20)	10 (27·7)
W.	85·7	14·3	18 (45)	3 (8·3)

* Of the 76 patients 40 had bilateral disease and 36 unilateral disease.

The Influence of Pleural Effusion.

The development of fluid in a pneumothorax cavity is generally held to have an adverse influence in the progress of the case. Our figures, however, do not bear this out. The idea of the evil effects of fluid has probably arisen from the fact that all types of fluid have been classed together without due regard to their nature and cause. We have very little actual knowledge as to their cause, but they can be classified according to their nature and behaviour. We find:—

1. Clear effusions, with small cell content, showing a high percentage of lymphocytes. These effusions, though persistent, do not tend to increase in amount; they are apparently more of the nature of transudates into an unnatural body cavity than actual inflammatory exudates. Their appearance is usually unaccompanied by constitutional disturbance.

2. Clear effusions, containing enough fibrin to clot, with a heavy cell content, showing a high percentage of lymphocytes and usually the presence of tubercle bacilli. They tend to increase in amount and to recur after removal, and must be regarded as definite inflammatory exudates from an invaded pleura. They probably occur after the pleura itself, previously free, has been invaded by the tuberculous process. Their onset is usually accompanied by constitutional disturbance which is often severe.

3. Cloudy or definitely purulent effusions with a heavy cell content, showing lymphocytes and polymorphonuclear leucocytes in varying proportions, with usually a preponderance of the latter. Tubercle bacilli are usually present, but the exudate is otherwise sterile. They tend to increase in amount and to recur after removal. They are sometimes purulent from the start, or No. 2 type may change into No. 3. Their onset is that of type No. 2. They tend to "point" sooner or later.

One cannot doubt that type No. 1 may be an innocuous phenomenon while type No. 3 may be very much the reverse, and therefore before the influence of pleural fluid in the progress of the case can be judged, the type of the fluid must be ascertained. Unfortunately in this present series of observations we have not recorded the different types of fluid, but the results show, we think, that the greater proportion must be of types No. 1 and No. 2.

Table IX. shows that the development of fluid has no deleterious influence on the immediate result; about the same percentage develop fluid in each class.

It has been said that exercise predisposes the patient to the development of fluid, but our figures in Table X. do not agree with this. The numbers do not correspond with those in Table IX., for in Table X. we have not included those cases in which fluid was present from the start of the artificial pneumothorax, as in gas replacements of pleural effusions, and spontaneous hydropneumothoraces subsequently converted into artificial ones. The development of fluid therefore is not determined by exercise, but more probably by the degree of involvement of the pleura by active tuberculosis, either present at the outset or occurring subsequently.

Tables XI. and XII. show that the presence of pleural fluid has no influence on the capacity for work or the likelihood of relapse. The length of time spent in relapse and the chance of relapse is equal for those with and without fluid. The figures in Table XI. do not refer to the total number of cases in each class, but only to those who relapsed in each class. We think that these figures are encouraging, as they show that, at any rate, non-purulent effusion, although a common complication of artificial pneumothorax, is not a serious one.

TABLE IX.

M.I.	Improved and slightly improved.	I.S.Q., worse, and dead.
With fluid .. 14 (37·8%)	7 (38·8%)	9 (42·8%)
Without fluid 23 (62·2%)	11 (61·2%)	12 (57·2%)

TABLE X. TABLE XI.

—	Patients developing fluid—		Percentage of time from exercise to discharge spent per patient in relapses—	
	Before exercise.	Subsequent to commencement of exercise.	With pleural fluid.	Without pleural fluid.
M.I. .	6	6	15·37	11·88
I. ..	2	2	15·38	20·26
W. ..	3	2	56·36	53·42

TABLE XII.—*Stage of Exercise, at Departure, of Patients With and Without Pleural Fluid.*

With Pleural Fluid.

—	No exercise.	½ to 1 mile.	1½ to 3 miles.	4 miles and grades 1 and 2.	Grades 3, 4, and 5.
M.I. ..	1	—	—	—	13
I.. ..	1	—	1	1	4
W. ..	7	1	—	1	—

Without Pleural Fluid.

—	No exercise.	½ to 1 mile.	1½ to 3 miles.	4 miles and grades 1 and 2.	Grades 3, 4, and 5.
M.I. ..	—	—	—	1	22
I.. ..	—	2	3	1	5
W. ..	7	2	—	1	—

Disappearance of Tubercle Bacilli from the Sputum.

Table XIII. shows that the disappearance of tubercle bacilli from the sputum as a result of the induction of an artificial pneumothorax is of the highest prognosis in his own class is justified for a patient who goes through all grades of labour without relapse and is discharged "much improved," then it follows that this test of ability to do a certain grade of walking exercise without relapse must be a valuable guide to the physician in the early stages of treatment.

TABLE I.

Patients—		Patients who relapsed.	Relapses.	Av. length of each relapse.	Longest relapse.	Shortest relapse.
				Days.	Days.	Days.
"Much improved" ..	37	13	25	15	47	4
"Improved" and "slightly improved"	18	13	22	22·2	182*	5
"I.S.Q.," "worse" and "died"	21	17	28	40·1	122	6

* Next longest 47 days.

TABLE II.

Class.	Days from start of exercise to discharge.	Relapses.	Av. length of stay from start of exercise to discharge.	Time spent in relapses.
		Days.	Days.	Per cent.
Much improved	6410	375	173·3	5·85
Improved ..	3288	488	182·7	14·84
Worse	2145	1124	107·3	52·49

TABLE III.

Patients who Reached Three Miles Daily (Men) and Two Miles Daily (Women) Without Relapsing: 46 out of 73 = 63·0 per cent.

Of these, the number discharged as—

M.I. was 33 or 71·7 per cent.
I. „ 9 „ 19·6 „
W. „ 4 „ 8·7 „

—i.e., 33 out of 46 patients reaching three miles (men) or two miles (women) without relapsing were discharged as M.I.

The chances of such a patient being discharged as M.I. are practically 2·4 to 1 in favour; or the chances of such a patient being discharged as worse are practically 10 to 1 against.

Patients who Relapsed Before Reaching Three Miles Daily (Men) or Two Miles Daily (Women): 27 out of 73 = 37 per cent.

Of these, the number discharged as—

M.I. was 4 or 14·8 per cent.
I. „ 9 „ 33·3 „
W. „ 14 „ 51·9 „

The chances of such a patient being discharged as M.I. are practically 6 to 1 against; or the chances of such a patient being discharged as worse are practically equal odds.

65 per cent. of patients who are discharged as much improved do *not* relapse at all. Of the 35 per cent. who do relapse, 70 per cent. do not do so until they have passed three miles daily (men) or two miles daily (women).

27·7 per cent. of patients who are discharged as improved do *not* relapse at all. Of the 72·3 per cent. which do relapse, 69·2 per cent. do so before passing three miles daily (men) or two miles daily (women).

5·5 per cent. of patients who are discharged as worse do *not* relapse at all. Of the 94·5 per cent. which do relapse, 82 per cent. break down before passing three miles daily (men) or two miles daily (women).

Temperature Types of Different Groups.

In our study of temperatures we have investigated certain points, and, in order to make these clear, we submit the following definitions:—

Regularity.—A regular temperature is taken as one in which the morning and evening range only varies by a fraction of a degree over a considerable period of time. A periodic temperature is regular, provided the amplitude of the waves remains fairly constant, and provided the swing on the crests does not vary much from the swing in the troughs. A spiky temperature is irregular.

Swing.—The swing is the daily fluctuation which occurs in the temperature, as measured by the difference between the morning and evening records.

Periodicity.—A temperature is said to be periodic when the mean of the morning and evening temperatures rises and falls at constant intervals. Comparatively slight evidences of periodicity have been accepted.

Our study of temperature records in artificial pneumothorax cases does not disclose any startling facts. Table IV.A shows, as might be expected, that those patients who do well tend to have the more regular temperature, which presumably indicates that their resistance to the toxins of tuberculosis is stable, and not likely to be upset by slight alterations in their daily routine. The daily swing is apparently of no prognostic importance, according to the figures in Table IV.B. This is interesting, since a free swing in an ordinary case of pulmonary tuberculosis is usually regarded as a bad omen, and is certainly pathological. The menstrual periodicity in the temperature records of a high percentage of all tuberculous women is so marked that it obscures the significance of this feature, but the figures in Table IV.C show that a definite periodicity suggests a bad prognosis in men.

Extending our observations to the characters of the temperature record during relapses, Tables V. and VI. show that the combination of a sudden rise with fall by crisis is most frequent in the "much improved" class, and that in the "much improved" and "improved" classes 50 per cent. of the sudden rise temperatures come down by crisis; in the "worse" class only about 20 per cent. do so. The more abrupt the start and finish of the temperature relapse the shorter is it likely to be. This, coupled with our observation that the shorter the relapse the better the prognosis, agrees with Marcus Paterson's teaching that a smart temperature reaction to increased exercise in many cases does no harm to the patient. Such a short, sharp temperature relapse would seem to indicate a brisk and healthy response on the part of the patient to increased toxin absorption, and it is suggested that a more sluggish temperature response is to be regarded with suspicion and is not a true index of the degree of increase of the toxæmia.

TABLE IV.

A.—*Regularity.* B.—*Swing.*

Patients.	Regular.	Irregular	To 1°.	1°–1·6°.	Over 1·6°.
	%	%	%	%	%
M.I. (37)	26 (70·3)	11 (29·7)	12 (32·4)	20 (54·1)	5 (13·5)
I. (18) ..	9 (50)	9 (50)	4 (22·2)	11 (61·1)	3 (16·7)
W. (21) .	4 (19)	17 (81)	7 (33·3)	8 (38·1)	6 (28·6)

C.—*Periodicity.*

Patients.	Men +.	Men –.	Women +.	Women –.
	%	%	%	%
M.I.	1 (7·4)	18 (92·6)	14 (77·8)	4 (22·2)
I.	5 (41·7)	7 (58·3)	4 (66·7)	2 (33·3)
W...	5 (45·5)	6 (54·5)	8 (80·0)	2 (20·0)

TABLE V.

Patients.	Number of relapses.	Sudden rise.	Wave rise.	Resolution by—	
				Crisis.	Lysis.
M.I.	20	12	8	6	14
I.	16	8	8	4 (1 no resolution)	11
W...	45	19 (2 no rise)	24	5 (4 no resolution)	36

TABLE VI.—*Length of Relapse in Days when Associated with—*

—	Sudden rise.	Wave rise.	Crisis.	Lysis.
M.I.	7·4	17·8	5·3	14·2
I.	6·9	10·9	6·3	9·9
W.	14·4	18·1	10·0	14·3

Degree of Completeness of Collapse.

Table VII. shows that those patients with a complete collapse tend to do better than those with only a partial collapse. But it is possible that this result may not be due to the actual completeness of the collapse, but to the fact that in those cases in which a complete collapse has been obtained the disease before induction may have been less extensive than in those in which the collapse was only partial. These figures, therefore, cannot be used as an argument for dividing adhesions in pneumothorax cases in order to produce complete collapse—a question which does not come within the scope of this paper.

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One cannot doubt that type No. 1 may be an innocuous phenomenon while type No. 3 may be very much the reverse, and therefore before the influence of pleural fluid in the progress of the case can be judged, the type of the fluid must be ascertained. Unfortunately in this present series of observations we have not recorded the different types of fluid, but the results show, we think, that the greater proportion must be of types No. 1 and No. 2.

Table IX. shows that the development of fluid has no deleterious influence on the immediate result; about the same percentage develop fluid in each class.

It has been said that exercise predisposes the patient to the development of fluid, but our figures in Table X. do not agree with this. The numbers do not correspond with those in Table IX., for in Table X. we have not included those cases in which fluid was present from the start of the artificial pneumothorax, as in gas replacements of pleural effusions, and spontaneous hydropneumothoraces subsequently converted into artificial ones. The development of fluid therefore is not determined by exercise, but more probably by the degree of involvement of the pleura by active tuberculosis, either present at the outset or occurring subsequently.

Tables XI. and XII. show that the presence of pleural fluid has no influence on the capacity for work or the likelihood of relapse. The length of time spent in relapse and the chance of relapse is equal for those with and without fluid. The figures in Table XI. do not refer to the total number of cases in each class, but only to those who relapsed in each class. We think that these figures are encouraging, as they show that, at any rate, non-purulent effusion, although a common complication of artificial pneumothorax, is not a serious one.

TABLE IX.

	M.I.	Improved and slightly improved.	I.S.Q., worse, and dead.
With fluid ..	14 (37·8 %)	7 (38·8 %)	9 (42·8 %)
Without fluid	23 (62·2 %)	11 (61·2 %)	12 (57·2 %)

TABLE X. TABLE XI.

—	Patients developing fluid—		Percentage of time from exercise to discharge spent per patient in relapses—	
	Before exercise.	Subsequent to commencement of exercise.	With pleural fluid.	Without pleural fluid.
M.I. .	6	6	15·37	11·88
I. ..	2	2	15·38	20·26
W. ..	3	2	56·36	53·42

TABLE XII.—*Stage of Exercise, at Departure, of Patients With and Without Pleural Fluid.*

With Pleural Fluid.

—	No exercise.	¼ to 1 mile.	1½ to 3 miles.	4 miles and grades 1 and 2.	Grades 3, 4, and 5.
M.I. ..	1	—	—	—	13
I.	1	—	1	1	4
W. ..	7	1	—	1	—
		Without Pleural Fluid.			
M.I. ..	—	—	—	1	22
I.	—	2	3	1	5
W. ..	7	2	—	1	—

Disappearance of Tubercle Bacilli from the Sputum.

Table XIII. shows that the disappearance of tubercle bacilli from the sputum as a result of the induction of an artificial pneumothorax is of the highest prognosis in his own class is justified for a patient who goes through all grades of labour without relapse and is discharged "much improved," then it follows that this test of ability to do a certain grade of walking exercise without relapse must be a valuable guide to the physician in the early stages of treatment.

TABLE I.

Patients—		Patients who relapsed.	Relapses.	Av. length of each relapse.	Longest relapse.	Shortest relapse.
				Days.	Days.	Days.
"Much improved" ..	37	13	25	15	47	4
"Improved" and "slightly improved"	18	13	22	22·2	182*	5
"I.S.Q.," "worse" and "died"	21	17	28	40·1	122	6

* Next longest 47 days.

TABLE II.

Class.	Days from start of exercise to discharge.	Relapses.	Av. length of stay from start of exercise to discharge.	Time spent in relapses.
		Days.	Days.	Per cent.
Much improved	6410	375	173·3	5·85
Improved ..	3288	488	182·7	14·84
Worse	2145	1124	107·3	52·49

TABLE III.

Patients who Reached Three Miles Daily (Men) and Two Miles Daily (Women) Without Relapsing: 46 out of 73 = 63·0 per cent.

Of these, the number discharged as—
M.I. was 33 or 71·7 per cent.
I. „ 9 „ 19·6 „
W. „ 4 „ 8·7 „

—i.e., 33 out of 46 patients reaching three miles (men) or two miles (women) without relapsing were discharged as M.I.

The chances of such a patient being discharged as M.I. are practically 2·4 to 1 in favour; or the chances of such a patient being discharged as worse are practically 10 to 1 against.

Patients who Relapsed Before Reaching Three Miles Daily (Men) or Two Miles Daily (Women): 27 out of 73 = 37 per cent.

Of these, the number discharged as—
M.I. was 4 or 14·8 per cent.
I. „ 9 „ 33·3 „
W. „ 14 „ 51·9 „

The chances of such a patient being discharged as M.I. are practically 6 to 1 against; or the chances of such a patient being discharged as worse are practically equal odds.

65 per cent. of patients who are discharged as much improved do *not* relapse at all. Of the 35 per cent. who do relapse, 70 per cent. do not do so until they have passed three miles daily (men) or two miles daily (women).

27·7 per cent. of patients who are discharged as improved do *not* relapse at all. Of the 72·3 per cent. which do relapse, 69·2 per cent. do so before passing three miles daily (men) or two miles daily (women).

5·5 per cent. of patients who are discharged as worse do *not* relapse at all. Of the 94·5 per cent. which do relapse, 82 per cent. break down before passing three miles daily (men) or two miles daily (women).

Temperature Types of Different Groups.

In our study of temperatures we have investigated certain points, and, in order to make these clear, we submit the following definitions:—

Regularity.—A regular temperature is taken as one in which the morning and evening range only varies by a fraction of a degree over a considerable period of time. A periodic temperature is regular, provided the amplitude of the waves remains fairly constant, and provided the swing on the crests does not vary much from the swing in the troughs. A spiky temperature is irregular.

Swing.—The swing is the daily fluctuation which occurs in the temperature, as measured by the difference between the morning and evening records.

Periodicity.—A temperature is said to be periodic when the mean of the morning and evening temperatures rises and falls at constant intervals. Comparatively slight evidences of periodicity have been accepted.

Our study of temperature records in artificial pneumothorax cases does not disclose any startling facts. Table IV.A shows, as might be expected, that those patients who do well tend to have the more regular temperature, which presumably indicates that their resistance to the toxins of tuberculosis is stable, and not likely to be upset by slight alterations in their daily routine. The daily swing is apparently of no prognostic importance, according to the figures in Table IV.B. This is interesting, since a free swing in an ordinary case of pulmonary tuberculosis is usually regarded as a bad omen, and is certainly pathological. The menstrual periodicity in the temperature records of a high percentage of all tuberculous women is so marked that it obscures the significance of this feature, but the figures in Table IV.C show that a definite periodicity suggests a bad prognosis in men.

Extending our observations to the characters of the temperature record during relapses, Tables V. and VI. show that the combination of a sudden rise with fall by crisis is most frequent in the "much improved" class, and that in the "much improved" and "improved" classes 50 per cent. of the sudden rise temperatures come down by crisis; in the "worse" class only about 20 per cent. do so. The more abrupt the start and finish of the temperature relapse the shorter is it likely to be. This, coupled with our observation that the shorter the relapse the better the prognosis, agrees with Marcus Paterson's teaching that a smart temperature reaction to increased exercise in many cases does no harm to the patient. Such a short, sharp temperature relapse would seem to indicate a brisk and healthy response on the part of the patient to increased toxin absorption, and it is suggested that a more sluggish temperature response is to be regarded with suspicion and is not a true index of the degree of increase of the toxæmia.

TABLE IV.

A.—*Regularity.* B.—*Swing.*

Patients.	Regular.	Irregular	To 1°.	1°–1·6°.	Over 1·6°.
	%	%	%	%	%
M.I. (37)	26 (70·3)	11 (29·7)	12 (32·4)	20 (54·1)	5 (13·5)
I. (18) ..	9 (50)	9 (50)	4 (22·2)	11 (61·1)	3 (16·7)
W. (21) .	4 (19)	17 (81)	7 (33·3)	8 (38·1)	6 (28·6)

C.—*Periodicity.*

Patients.	Men +.	Men −.	Women +.	Women −.
	%	%	%	%
M.I.	1 (7·4)	18 (92·6)	14 (77·8)	4 (22·2)
I.	5 (41·7)	7 (58·3)	4 (66·7)	2 (33·3)
W.	5 (45·5)	6 (54·5)	8 (80·0)	2 (20·0)

TABLE V.

Patients.	Number of relapses.	Sudden rise.	Wave rise.	Resolution by—	
				Crisis.	Lysis.
M.I.	20	12	8	6	14
I.	16	8	8	4 (1 no resolution)	11
W.	45	19 (2 no rise)	24	5 (4 no resolution)	36

TABLE VI.—*Length of Relapse in Days when Associated with—*

—	Sudden rise.	Wave rise.	Crisis.	Lysis.
M.I.	7·4	17·8	5·3	14·2
I.	6·9	10·9	6·3	9·9
W.	14·4	18·1	10·0	14·3

importance in prognosis. These figures speak for themselves and require no elaboration; and it seems that the disappearance of bacilli will occur even though there be disease in the opposite lung, and in cases where only a partial collapse has been obtained. For of the 35 "much improved" cases who lost their bacilli 15 had bilateral disease and 17 had a partial collapse; of the 9 "improved" cases 3 had bilateral disease and 6 a partial collapse; of the 5 of the "worse" class 1 had bilateral disease and 4 a partial collapse.

TABLE XIII.

Total number of cases whose records with regard to presence or absence of tubercle bacilli in sputum are known	75
Number of patients whose sputum became negative after A.P.	49 (65·3 per cent.)
Of these, discharged as much improved.	35 (71·4 ,, ,,)
,, ,, ,, ,, improved	9 (18·4 ,, ,,)
,, ,, ,, ,, worse	5 (10·2 ,, ,,)
Number of patients whose sputum remained positive after A.P.	26 (34·7 per cent.)
Of these, discharged as much improved.	2 (7·7 ,, ,,)
,, ,, ,, ,, improved	8 (30·8 ,, ,,)
,, ,, ,, ,, worse	16 (61·5 ,, ,,)

Importance of Changes in the Weight of the Patient.

Table XIV. shows that a steady gain in weight is valuable evidence of the satisfactory response of the patient to treatment. It is important to notice that this table does not refer to the changes in weight occurring from the time of induction of the pneumothorax but from the commencement of sanatorium treatment, which was generally three to four months later.

TABLE XIV.

—	Gain in weight.	Steady.	Loss.
	Per cent.	Per cent.	Per cent.
M.I.	73·0	24·3	2·7
I.	35·3	29·4	35·3
W.	13·3	26·7	60·0

TABLE XV.

	Av. length of stay in days from exercise to discharge.
M.I.—Gained weight, 27	183·7
Remained steady, 9	149·9
Lost weight, 1	118·0
I.—Gained weight, 6	229·3
Remained steady, 5	190·0
Lost weight, 6	139·7
W.—Gained weight, 2	180·0
Remained steady, 4	65·0
Lost weight, 9	122·0

Those in bed, or for other reasons not weighed, excluded.

TABLE XVI.

	Av. gain in weight.
M.I.—Patients with fluid, 14	14·6 lb.
Patients without fluid, 23	4·4 ,,

	Av. loss in weight.
I.—Patients with fluid, 6	0·4 lb.
Patients without fluid, 11	1·6 ,,

(1 improved patient with fluid was not weighed.)

	Av. loss in weight.
W.—Patients with fluid, 7	2·6 lb.
Patients without fluid, 8	7·2 ,,

(2 worse patients with fluid and 4 without were not weighed.)

TABLE XVII.

	Av. length of stay in days from exercise to discharge.
M.I.—Patients with fluid, 14	194
Patients without fluid, 23	160
I.—Patients with fluid, 6	225
Patients without fluid, 11	165
W.—Patients with fluid, 7	125
Patients without fluid, 8	105

We also found that those patients who relapsed or had pleural fluid gained weight or lost according to the class that they were in, uninfluenced by the relapse or the fluid. The explanation of this somewhat surprising fact appears to be, as is shown in Tables XV., XVI., and XVII., that gain of weight was more probable in those who had the longer stay in the sanatorium, which was the case with those who relapsed and those who had pleural fluid.

A careful inspection of these tables will reveal a definite correlation between the length of stay and the increase in weight. Only one exception occurs—namely, that with the patients of the "worse" class who lost weight; the probable explanation in this case is that they had entered upon a pyrexial relapse which prevented their being discharged, and at the conclusion of which they were removed to an infirmary as being unlikely to derive benefit from sanatorium treatment. Apart from this one class, however, the correlation is valid. Remembering the limited number of cases which are being dealt with, one cannot expect to find an exact quantitative correlation between the length of stay and the increase in weight. but the fact that the variation uniformly occurs in the same direction serves to show that the relationship is not a fictitious one.

Conclusions.

1. If a relapse occurs during the exercise treatment of an artificial pneumothorax case, there are two salient points of interest: (*a*) the longer it is, the worse is the prognosis; (*b*) the earlier it occurs the less likely is the patient to do well. A relapse which takes place for the first time when the patient has reached an advance grade of exercise seems to be of singularly little importance. We may say that if a patient is going to do badly, he will relapse early; if he is going to do well, he will relapse late or not at all.

2. A regular temperature is of good prognostic significance; an irregular one is the reverse. In men a periodic temperature is an unfavourable feature. The daily variation seems to have no special significance.

3. We find that the patients who have done well have more often had a complete collapse than those who have done badly. In the absence of any quantitative estimation of the degree of completeness of the collapse, and in view of the fact that the extent of disease has varied considerably in our patients, we refrain from drawing any conclusions as to the meaning of this observation.

4. It is clear that a considerable number of patients with bilateral disease are capable of responding well to artificial pneumothorax treatment, and of reacting favourably to the system of graduated exercise which is given to them preparatory to their ingress once more into the world of activity.

5. It is probably fair to say that the development of pleural fluid—so long as it be not of a purulent type—is a matter of supreme indifference to the prognosis of the case. It is interesting, too, to note we have no evidence which suggests that the advent of fluid is likely to be occasioned by exercise.

6. Persistence of tubercle bacilli in the sputum after the induction of artificial pneumothorax is a feature of bad omen. Our figures show that if the sputum remains positive the chances are 10 to 1 against the patient being discharged as much improved.

7. One of the most valuable criteria of the patient's reaction to treatment is the change in weight which occurs after his admission to the sanatorium. Though it is not uncommon for patients, even in the worse class, to gain a little in weight, it is very uncommon for those who are going to do well to lose any. How true this is can be seen from our tables, which show that if a patient loses weight progressively after starting exercise the chances are 37 to 1 against his being discharged as much improved. An early loss in weight should prove a most valuable arresting signal. and should lead to a careful reconsideration of the further treatment of the patient.

8. The longer the patient's stay in the sanatorium the more weight is he likely to gain or the less is he

ikely to lose. Though not desiring to extol sanatorium treatment, above other methods, we consider that this fact reflects very favourably on this form of treatment.

In this paper we have been concerned with an examination of the results obtained by the graduated exercise treatment of patients on whom an artificial pneumothorax has been induced either by choice or by necessity. We do not wish to advocate this method, as, from the nature of the cases, it has been more or less forced on us, but we would point out that under it no fewer than 49 per cent. of an unselected, consecutive series of cases have been discharged as much improved and capable of earning their living in the world. With the indications which we have gathered from this examination, with the danger signals more clearly pointed out than heretofore, and with the elucidation of certain promising features to give us confidence in the pursuit of treatment, we feel that it should not be impossible in the future to secure results which will be even more hopeful than those obtained in our present series.

ARTIFICIAL PNEUMOTHORAX.

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In 1922 Dr. A. S. MacNalty and I issued a report[1] to the Medical Research Council on artificial pneumothorax. The present paper is a second report to the Council on the same subject, and I propose to give the results up to date of my first 250 cases and to consider the dangers and complications which may arise during the treatment. In conclusion, I shall discuss the value and limitation of artificial pneumothorax in the treatment of pulmonary disease.

Results of Treatment.

In order to analyse the results of treatment I divided my cases into the following groups:—

A. Patients with little or no powers of resistance, and a rapidly spreading acute infection.

B. Patients with good powers of resistance and in the early stage of the disease.

C. Patients with medium resistance who have failed to improve after other treatment. This group is subdivided into:—

(1) Involvement of one lung only; (2) some involvement of the better lung; and (3) involvement of a third or more of the better lung.

D. Non-tuberculous cases.

Tubercle bacilli were found in the sputum in all cases except those in Group D.

The following tables give an analysis of my first series (150 cases) arranged according to the above groups, and show the result of treatment in May, 1922, when the previous report was written, and the condition of the same patients in January, 1924. By arrested is meant disappearance of tubercle bacilli from the sputum for at least six months, no apparent active disease, and ability to do full work.

From the 107 cases in Table I. it will be seen that the results in Group C 1 are good and are remaining good, especially when one remembers that in each of these cases artificial pneumothorax was induced only because the patient was not making good progress under other treatment. When we turn to Groups C 2 and C 3 the results are not good. This one would expect, because the pneumothorax rests only one lung, and it is therefore only part of the diseased area that is having treatment in cases of bilateral disease.

Table I.—*Cases in which an Efficient Pneumothorax was Produced.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	2	27	4	—	7	40
1924 ..	—	2	30	4	—	8	44
Better—							
1922 ..	—	—	13	6	1	2	22
1924 ..	—	—	6	4	1	2	13
No change—							
1922 ..	—	—	1	6	2	3	12
1924 ..	—	—	—	2	—	1	3
Worse—							
1922 ..	—	—	—	7	6	—	13
1924 ..	—	—	4	2	—	—	6
Dead—							
1922 ..	3	—	2	3	9	3	20
1924 ..	3	—	3	14	17	4	41
Total ..	3	2	43	26	18	15	107

Table II.—*Cases in which only a Partial and Incomplete Collapse was Produced.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	—	—	—	—	—	0
1924 ..	—	—	1	—	—	—	1
Better—							
1922 ..	—	—	2	1	—	—	3
1924 ..	—	—	1	—	—	—	1
No change—							
1922 ..	—	—	2	1	—	—	3
1924 ..	—	—	—	1	—	—	1
Worse—							
1922 ..	—	—	—	1	—	—	1
1924 ..	—	—	2	—	—	—	2
Dead—							
1922 ..	2	—	1	2	7	1	13
1924 ..	2	—	1	4	7	1	15
Total ..	2	0	5	5	7	1	20

Table III.—*Cases where Pneumothorax could not be Produced owing to Adherent Pleura.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	—	—	—	—	—	0
1924 ..	—	—	—	—	—	—	0
Better—							
1922 ..	—	—	2	—	—	—	2
1924 ..	—	—	1	—	—	—	1
No change—							
1922 ..	—	—	4	2	—	—	6
1924 ..	—	—	2	—	—	—	2
Worse—							
1922 ..	—	—	1	5	—	1	7
1924 ..	—	—	—	2	—	—	2
Dead—							
1922 ..	2	—	1	—	4	1	8
1924 ..	2	—	5	5	4	2	18
Total ..	2	0	8	7	4	2	23

The following tables give the result of my first 250 cases (which, of course, include the 150 already given). I do not think it necessary to have a special subdivision for Group B, so in these tables Group C 1 includes those formerly in B. There were only two cases. I have also separated those cases which started as spontaneous pneumothoraces.

Table IV.—*Cases in which an Efficient Pneumothorax was Produced.*

—	S.P.	A.	C 1.	C 2.	C 3.	D.	Total.
Arrested ..	2	—	50	17	—	13	82
Better ..	—	1	8	13	1	2	25
No change ..	1	—	3	6	—	4	14
Worse ..	2	—	6	7	1	—	16
Dead	3	3	4	18	19	6	53
Total ..	8	4	71	61	21	25	190

S.P. = Spontaneous pneumothorax.

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[1] L. S. T. Burrell and A. Salusbury MacNalty: Report on Artificial Pneumothorax, Medical Research Council, Special Report Series 67. London. 1922.

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6. Persistence of tubercle bacilli in the sputum after the induction of artificial pneumothorax is a feature of bad omen. Our figures show that if the sputum remains positive the chances are 19 to 1 against the patient being discharged as much improved.

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8. The longer the patient's stay in the sanatorium the more weight is he likely to gain or the less is he

likely to lose. Though not desiring to extol sanatorium treatment, above other methods, we consider that this fact reflects very favourably on this form of treatment.

In this paper we have been concerned with an examination of the results obtained by the graduated exercise treatment of patients on whom an artificial pneumothorax has been induced either by choice or by necessity. We do not wish to advocate this method, as, from the nature of the cases, it has been more or less forced on us, but we would point out that under it no fewer than 49 per cent. of an unselected, consecutive series of cases have been discharged as much improved and capable of earning their living in the world. With the indications which we have gathered from this examination, with the danger signals more clearly pointed out than heretofore, and with the elucidation of certain promising features to give us confidence in the pursuit of treatment, we feel that it should not be impossible in the future to secure results which will be even more hopeful than those obtained in our present series.

ARTIFICIAL PNEUMOTHORAX.

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IN 1922 Dr. A. S. MacNalty and I issued a report[1] to the Medical Research Council on artificial pneumothorax. The present paper is a second report to the Council on the same subject, and I propose to give the results up to date of my first 250 cases and to consider the dangers and complications which may arise during the treatment. In conclusion, I shall discuss the value and limitation of artificial pneumothorax in the treatment of pulmonary disease.

Results of Treatment.

In order to analyse the results of treatment I divided my cases into the following groups:—

A. Patients with little or no powers of resistance, and a rapidly spreading acute infection.

B. Patients with good powers of resistance and in the early stage of the disease.

C. Patients with medium resistance who have failed to improve after other treatment. This group is subdivided into:—

(1) Involvement of one lung only; (2) some involvement of the better lung; and (3) involvement of a third or more of the better lung.

D. Non-tuberculous cases.

Tubercle bacilli were found in the sputum in all cases except those in Group D.

The following tables give an analysis of my first series (150 cases) arranged according to the above groups, and show the result of treatment in May, 1922, when the previous report was written, and the condition of the same patients in January, 1924. By arrested is meant disappearance of tubercle bacilli from the sputum for at least six months, no apparent active disease, and ability to do full work.

From the 107 cases in Table I. it will be seen that the results in Group C 1 are good and are remaining good, especially when one remembers that in each of these cases artificial pneumothorax was induced only because the patient was not making good progress under other treatment. When we turn to Groups C 2 and C 3 the results are not good. This one would expect, because the pneumothorax rests only one lung, and it is therefore only part of the diseased area that is having treatment in cases of bilateral disease.

TABLE I.—*Cases in which an Efficient Pneumothorax was Produced.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	2	27	4	—	7	40
1924 ..	—	2	30	4	—	8	44
Better—							
1922 ..	—	—	13	6	1	2	22
1924 ..	—	—	6	4	1	2	13
No change—							
1922 ..	—	—	1	6	2	3	12
1924 ..	—	—	—	2	—	1	3
Worse—							
1922 ..	—	—	—	7	6	—	13
1924 ..	—	—	4	2	—	—	6
Dead—							
1922 ..	3	—	2	3	9	3	20
1924 ..	3	—	3	14	17	4	41
Total ..	3	2	43	26	18	15	107

TABLE II.—*Cases in which only a Partial and Incomplete Collapse was Produced.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	—	—	—	—	—	0
1924 ..	—	—	1	—	—	—	1
Better—							
1922 ..	—	—	2	1	—	—	3
1924 ..	—	—	1	—	—	—	1
No change—							
1922 ..	—	—	2	1	—	—	3
1924 ..	—	—	—	1	—	—	1
Worse—							
1922 ..	—	—	—	1	—	—	1
1924 ..	—	—	2	—	—	—	2
Dead—							
1922 ..	2	—	1	2	7	1	13
1924 ..	2	—	1	4	7	1	15
Total ..	2	0	5	5	7	1	20

TABLE III.—*Cases where Pneumothorax could not be Produced owing to Adherent Pleura.*

Group—	A.	B.	C 1.	C 2.	C 3.	D.	Total.
Arrested—							
1922 ..	—	—	—	—	—	—	0
1924 ..	—	—	—	—	—	—	0
Better—							
1922 ..	—	—	2	—	—	—	2
1924 ..	—	—	1	—	—	—	1
No change—							
1922 ..	—	—	4	2	—	—	6
1924 ..	—	—	2	—	—	—	2
Worse—							
1922 ..	—	—	1	5	—	1	7
1924 ..	—	—	—	2	—	—	2
Dead—							
1922 ..	2	—	1	—	4	1	8
1924 ..	2	—	5	5	4	2	18
Total ..	2	0	8	7	4	2	23

The following tables give the result of my first 250 cases (which, of course, include the 150 already given). I do not think it necessary to have a special subdivision for Group B, so in these tables Group C 1 includes those formerly in B. There were only two cases. I have also separated those cases which started as spontaneous pneumothoraces.

TABLE IV.—*Cases in which an Efficient Pneumothorax was Produced.*

—	S.P.	A.	C 1.	C 2.	C 3.	D.	Total.
Arrested ..	2	—	50	17	—	13	82
Better ..	—	1	8	13	1	2	25
No change ..	1	—	3	6	—	4	14
Worse ..	2	—	6	7	1	—	16
Dead	3	3	4	18	19	6	53
Total ..	8	4	71	61	21	25	190

S.P. = Spontaneous pneumothorax.

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[1] L. S. T. Burrell and A. Salusbury MacNalty: Report on Artificial Pneumothorax, Medical Research Council, Special Report Series 67. London. 1922.

Table V.—*Cases in which only a Partial and Incomplete Collapse was Produced.*

—	A.	C 1.	C 2.	C 3.	D.	Total.
Arrested	—	2	—	—	1	3
Better	—	1	2	—	—	3
No change	—	—	1	—	—	1
Worse	—	2	1	—	—	3
Dead	3	1	5	11	1	21
Total	3	6	9	11	2	31

Table VI.—*Cases where Pneumothorax could not be Produced owing to Adherent Pleura.*

—	A.	C 1.	C 2.	C 3.	D.	Total.
Arrested	—	—	—	—	—	0
Better	—	2	—	—	—	2
No change	—	3	2	—	—	5
Worse	—	1	2	—	—	3
Dead	2	5	6	4	2	19
Total	2	11	10	4	2	29

As one would expect, the more extensive the disease the less chance there is of producing an efficient pneumothorax, and it will be seen that I failed to produce an efficient one in 17 cases (19·3 per cent.) out of the 88 in Group C 1; in 19 (23·7 per cent.) out of the 80 in C 2; and in 15 (41·6 per cent.) out of the 36 in C 3. If Table VI. is compared with Table III. it will also be seen that there were far fewer failures in the last series. Of the first 150 cases I failed to produce any pneumothorax at all in 23. Of the next 100 cases I failed in 6, and since then I have treated 94 more cases with 7 failures. At present, therefore, the percentage of complete failures is 6·6.

The figures in Table IV. are very similar to those in Table I., and show good results in Group C 1, but very bad in C 3, and poor in C 2. This supports the opinion formed after consideration of the first 150 cases, that for the most part it is only in unilateral cases that really good results are obtained by artificial pneumothorax. In many of the bilateral cases the immediate results are excellent, and in some cases dramatic, but after a time they usually relapse so that the late results are not good. The following two cases illustrate the good results obtained at first in bad cases; results which must be attributed to the treatment, for the improvement followed so immediately after its beginning.

Case 1.—A woman, aged 38, developed tuberculosis of the left lung in 1916 and went to a sanatorium for nine months. She improved and kept fairly well until 1919, when she began to lose ground, and in February, 1920, she took to bed with an evening temperature of 101°–102°F. She steadily grew worse, and in August she was much wasted, was still running the same temperature, and had copious expectoration. There were signs of disease all over the left lung, and moist râles were heard at the right apex, both in front and behind. X rays showed disease all over the left lung and considerable infiltration of the upper and middle zones on the right side. Left artificial pneumothorax was induced, and the temperature at once fell to normal, the cough improved, and the sputum lessened. In September she got up, and later was able to take short walks. In January, 1921, however, the high temperature returned, and the treatment was stopped owing to spread of disease on the right side. She gradually became worse and died in June, 1921.

Case 2.—A woman of 36 contracted tuberculosis of the left lung in 1919, and after treatment at home went to a sanatorium for three months in 1920, and then had a voyage to Australia for three months. On her return she was much wasted, and had a severe cough with sputum loaded with tubercle bacilli. There were moist râles all over the left lung, and on the right side moist sounds were heard in front to the third rib in the nipple line, and behind to the spine of the scapula. X rays showed much disease in both lungs. Her weight, which normally was 130 lb., was then only 109 lb.; she looked toxic and had a swinging temperature. In August, 1921, I induced a left pneumothorax and gave small frequent refills. She gradually improved, tubercle bacilli became fewer and fewer, and eventually disappeared from the sputum. For a time the right (untreated) lung appeared to improve, and her weight went up to 121 lb. In February, 1923, however, she had a febrile attack and rapidly became worse. There was an increase of signs on the right side, and the refills were stopped. Now (January, 1924) her weight is 109 lb., she is afebrile whilst in bed, but has an evening temperature if allowed up. The left lung is re-expanded and fibrotic, but the disease has spread over the right side. The question of inducing a right pneumothorax is being considered, and she herself is anxious for it to be done as she felt so much benefit from the first pneumothorax.

Complications and Dangers.

Effusion.—The development of pleural effusion is a frequent and important complication of artificial pneumothorax treatment. Forty of my first 150 and 26 of my next 100 cases developed it. Of the last 94 cases 19 have already developed effusion, and more are certain to develop it later, as in many cases the treatment has only recently been started. It would seem, therefore, that increased experience does not affect the incidence of this complication. I have not found that such means as warming the gas or using some gas other than air have any effect in preventing the formation of these effusions.

Table VII.—*Showing the Time After Starting the Treatment when the Effusion Appeared in My First 250 Cases.*

Month—	A.	C 1.	C 2.	C 3.	D.	Total.
1st	2	1	2	4	1	10
2nd and 3rd ..	—	4	9	3	—	16
4th to 6th ..	1	8	9	1	—	19
7th to 12th ..	—	8	8	—	—	16
13th to 18th ..	—	3	1	—	—	4
19th to 24th ..	—	—	1	—	—	1
Total	3	24	30	8	1	66

Thus 24 (33·8 per cent.) of the 71 cases in Group C 1, 30 (49·1 per cent.) of the 61 in C 2, and 8 (36·1 per cent.) of the 21 in C 3 developed pleural effusion. The smaller percentage in Group C 3 does not indicate that advanced cases are less liable to develop effusion than others, for many of these cases either died soon after the treatment started or the treatment was stopped early owing to the advanced disease. Of the 14 cases in Group C 3 in which the treatment was kept up for more than 6 months 8 (57·1 per cent.) developed effusion.

Table VIII.—*Showing the Result of Treatment in Groups C 1 and C 2 in My First 250 Cases in those with and without Effusion.*

—	With effusion.		Without effusion.	
	C 1.	C 2.	C 1.	C 2.
Arrested	19	5	31	12
Better	1	8	7	5
No change..	—	4	3	2
Worse	2	2	4	5
Dead	2	11	2	7
Total	24	30	47	31

It would seem, therefore, that in Group C 1 cases with effusion do as well as those without. In Group C 2, however, those patients who developed effusion did less well than the others. In 14 cases the effusion turned into tuberculous pus. Of these 7 were in Group C 1, 4 being arrested, 1 better, and 2 worse. Excluding those cases in which artificial pneumothorax was induced to replace effusion, I have treated 20 non-tuberculous cases by pneumothorax, and except in one case of an acute abscess, where X rays showed a small pool of fluid not sufficient to fill in the costo-diaphragmatic angle and which was absorbed in a few days, not one of these non-tuberculous cases developed effusion. Moreover, the cytology in all cases when fluid was removed showed a big lymphocytosis, and no organism except the tubercle bacillus was found in any case. Tubercle bacilli were not found as a rule in the early stages of the effusion, but they invariably appeared in effusions of long standing. Tuberculous pleurisy is a common complication of pulmonary tuberculosis, and if the visceral and parietal pleura are separated by a pneumothorax so that any exudate cannot produce adherent pleura one would expect the pleura to weep and cause an effusion. For these reasons I am inclined to believe that these effusions are tuberculous exudates, and are common in cases of pneumothorax because the visceral and parietal pleuræ are not in contact.

Pleural shock or *gas embolism* may occur during the production of a pneumothorax or during a refill. Fortunately, these accidents are very rare. Out of 344 cases (and if one includes cases in which a bilateral pneumothorax was induced and cases where the first attempt to produce a pneumothorax failed and other attempts were made, 467 punctures of the pleura with the purpose of inducing a pneumothorax) I have had one case of fatal pleural shock, and this was at the second attempt. In one case the patient became faint and almost pulseless for a few minutes, and in three others the patients complained of a temporary feeling of faintness. Out of 5157 refills 9 complained of a temporary faintness, and one became faint and nearly pulseless for a few minutes during a refill. In one case the symptoms were more alarming: during the third refill the patient felt giddy, after the fourth refill she had a sudden pain over the heart and could not breathe and lost consciousness for about two minutes. During the fifth refill she suddenly gave a gasp, became blue and almost pulseless, and afterwards said she felt as if about to die. She did not actually lose consciousness and was all right half an hour later. The treatment was discontinued. In one other case during the third year of treatment the patient became giddy a few minutes after a refill and felt pins and needles down one side and lost her sight for about ten minutes, but did not lose consciousness. This last case, I think, was one of gas embolism, but I feel sure that all cases are not due to embolism and that pleural shock exists. Often on giving a local anæsthetic when there can be no question of embolism the patient complains of a sickly feeling as soon as the small hypodermic needle touches the pleura. Moreover, symptoms of shock are apt to recur in the same patient, apparently because the pleura is hypersensitive. This would not be the case if the symptoms were due to gas embolism.

In two of my cases a spontaneous pneumothorax occurred on the better side and led to a fatal issue. In six cases there was a *rupture of the visceral pleura* on the treated side leading to pyopneumothorax. Two of these cases were in non-tuberculous patients and both recovered. The others were cases of pulmonary tuberculosis, three proved fatal and the other is dying. It often happens that a small amount of *surgical emphysema* occurs, but in only one of my cases was it serious. In this case two attempts were made to induce an artificial pneumothorax, but they failed owing to adherent pleura. 24 hours later the patient complained of pain across the chest, and some surgical emphysema was found in the chest and neck. Two days later it had spread all over the chest and abdomen. Both arms and hands were affected, and the neck, face, and scalp were much swollen with the emphysema, and he could hardly see out of his eyes. There was no emphysema below Poupart's ligament. There was no pyrexia, and no pain or symptoms except a slight choking feeling. After three days the emphysema began to subside, and it had completely disappeared in a week.

Value and Limitations of the Treatment.

From a study of these cases it seems to me that artificial pneumothorax is a safe and satisfactory method of resting a diseased lung. As it is impossible to rest both lungs at once one would expect the results to be much better in unilateral than in bilateral cases, and this is found to be the case. Indeed, a highly active and extensive lesion in one lung readily yields to pneumothorax treatment, and the case does better than one with smaller and less active lesions in both lungs. The great difference between the results in unilateral and bilateral disease is, I think, strong evidence that the pneumothorax is the important factor in checking the disease. But bilateral disease is not necessarily a contra-indication. When the lung with most disease is collapsed the other lung usually improves at first, just as in other tuberculous lesions when the main focus is removed. For instance, ulceration of the bladder may heal after removal of a tuberculous kidney. After a time, however, disease frequently spreads in the untreated lung, and although on allowing re-expansion of the diseased lung there is usually improvement on both sides, and the case may be converted into a chronic fibroid type lasting several years, the ultimate prognosis is not good. If activity persists in the untreated lung after re-expansion of the other it is sometimes possible to induce a pneumothorax on that side. This often gives very good immediate results, but here again the ultimate results are disappointing. Even in very advanced cases life may be considerably prolonged by artificial pneumothorax.

It is sometimes said that these unilateral cases which do so well with pneumothorax treatment are just the type which do well on any treatment; but these pneumothorax patients had had other treatment, and pneumothorax was induced only because they were not doing well under it. It is true that a patient under hospital or sanatorium treatment may improve after doing badly at first, but the number of successful results in pneumothorax cases *who were doing badly under other treatment* is worthy of note.

Indications for Artificial Pneumothorax.

The question arises, When should an artificial pneumothorax be advised? Clearly it is wrong to wait until all other treatment has failed and the patient is in an advanced stage of disease. On the other hand, if the patient is treated properly and at once, pneumothorax treatment does not, as a rule, become necessary.

There are two factors which affect the treatment of the earlier cases. In the first place, the importance of rest during active disease is not appreciated; patients who ought to be in bed are walking about and even playing games. Bed is considered weakening. Fresh air and good feeding are, I agree, very necessary, but far more important is rest. In the second place, the gravity of the disease in the early stages is often underrated. A certain number of cases do undoubtedly recover without any treatment whatever, but many do not. In England and Wales in 1922 over 55,000 people were notified as having pulmonary tuberculosis, and over 42,000 died of it. Treatment is satisfactory only in early cases, and it is therefore these cases that most urgently require treatment, which should be kept up until the disease is arrested. It should not be stopped when the patient is better but not well.

As I have said, if the case comes under observation early artificial pneumothorax is not usually required, because a period of rest followed by sanatorium treatment is generally sufficient to effect arrest. But if in spite of rest the patient fails to improve or becomes worse, then I should advise rest of the diseased lung by means of artificial pneumothorax, in addition to the other treatment. In favour of this I would urge: (1) It is a safe method of treatment; (2) unilateral cases do very well, even those which were getting worse under other treatment; (3) the earlier the pneumothorax is induced the less chance there is of finding adhesions which may prevent a satisfactory collapse; (4) every case of advanced disease has passed through an early stage. Whilst encouraging the patient and taking an optimistic view the physician should remember that the great object of treatment is to prevent the disease from getting into the incurable stage. A patient is often too bad for treatment but never not bad enough.

In bilateral cases, if there is not much activity in the better lung, satisfactory results may be obtained, but the better lung should be carefully watched, and if the disease spreads in it pneumothorax treatment should be stopped. In non-tuberculous cases very good results are obtained in cases of abscess of lung, repeated hæmoptysis, and recurrent pleural effusion. In cases of bronchiectasis there is often improvement, but the results are not so good as there is usually a considerable amount of adherent pleura, and also in most cases the disease is bilateral.

Artificial pneumothorax should be regarded not as a cure for tuberculosis of lung, but as a safe method of resting the diseased part, and it should be used in conjunction with other methods of treatment.

Finally, I would say that the success of the treatment is largely dependent on really keeping the lung at rest, taking each case individually and arranging the dosage and intervals between the refills according to the peculiarities of the individual patient.

A CASE OF GAUCHER'S ANÆMIA.

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Gaucher's anæmia has been studied in all European countries and America, so that its incidence is evidently widespread, and probably not so rare as heretofore imagined. Reuben, in 1914, analysed 14 cases of children dating from Gaucher's original paper in 1886; since then 10 have been definitely claimed, mostly in the States, and three or four unproven diagnoses have also been made. The following case is considered as belonging to the same group, though it shows some variation from the characteristic story.

The disease occurred in a girl of 1 year 10 months who was perfectly well until a fortnight before admission to hospital. She then suddenly seemed to lose colour, became apathetic and lost weight. She vomited twice and was rather constipated. There was no history of hæmorrhage from any source. She was the first and only child of young healthy parents, and though always under-weight had shown normal muscular, bone, and mental development.

Condition on Admission.—On examination she was noticed to be of a golden-yellow hue with pale mucous membranes and a fair quantity of subcutaneous fat. Her weight was 18 lb. 7 oz. There was no conjunctival thickening. The condition of the mouth was healthy except that the tonsils were enlarged. The chest showed no abnormality. Small glands were palpable in the axilla. The abdomen was distended by flatulence. There was a large, hard, tender spleen reaching to the level of umbilicus. The nervous system was normal. The urine contained acetone and a few red cells, but showed no other abnormality. The fæces contained no occult blood. The Wassermann reaction was negative and the fragility of the red cells was not increased. The blood report was as follows: red cells, 1,070,000 per c.mm.; white cells, 14,400 per c.mm.; Hb, 28 per cent.; colour index, 1·4. Differential count: Polymorphonuclears, 56 per cent.; lymphocytes, 39 per cent.; transitional, 4 per cent.; mast cells, 1 per cent. The red cells were variable in size with many myelocytes but regular in shape. Polychromatophilia was common, but no punctate basophilia was observed. One nucleated red cell was noted in the film. In several films examined only one myelocyte of an adult type was found. The temperature and pulse and respiration were all irregular, the temperature rising to 101° F. each day, and the pulse varying between 120 and 170 per minute. The patient remained one week in hospital, during which time she failed to respond to treatment with arsenic, but did not show any rapid change for the worse until the seventh day, when she died suddenly with acute œdema of the lungs. A few days before this, four or five minute petechiæ, which quickly became brown and faded, appeared in the skin over the abdomen.

Post-mortem Examination.—The adenoid pad and tonsils were slightly enlarged and one tonsil contained two small purulent foci. The lungs showed considerable œdema, but no pneumonia or hæmorrhages. The heart muscle presented obvious fatty degeneration but no other lesion. In the abdomen there was gaseous distension of the stomach and intestines. There was no lymphoid hyperplasia. The liver was slightly enlarged and showed no naked-eye changes. Free iron was just demonstrable. The spleen was attached by recent adhesions to the stomach and posterior wall of the abdomen. It was much enlarged and weighed 8 oz. The organ was firm and the notches prominent. On section the pulp was firmer than normal and bright red in colour. The Malpighian bodies were not enlarged. A large and a small white infarct were present. Free iron could be demonstrated. The kidneys were very pale, but otherwise normal to the naked eye. The thymus was not enlarged. The endocrine glands showed no change. The cervical lymph glands were all enlarged, pale, and firm and were quite discrete. The mediastinal and mesenteric glands were normal in size, but there was enlargement of those near the spleen and in the retro-peritoneal tissue. The bone-marrow was pink in colour, but did not appear to be hyperplastic. Cultures were taken from the splenic pulp and found to be sterile.

Microscopical Examination.—The low-power view of sections of the spleen presented a series of rounded spaces which were well defined by fibrous tissue, and partially filled with Gaucher cells. There were so many of these half-empty spaces that the spleen was almost lobulated in appearance. It could not actually be demonstrated that these were venous spaces, though it was probable, and they had the same appearance as those which Mandelbaum describes as such in his specimens. No endothelial lining was visible. The cells, which were of the Gaucher type, were large and oval and rounded, sometimes with a nucleus to one side and semilunar in shape, and sometimes with the nucleus round and more or less in the centre. The cytoplasm did not stain clearly and was often foamy; many cells also had definitely clear vacuoles, but none stained as fat with Sudan III., and there were no doubly refracting crystals in any part of the tissue. Some of the cells contained a well-formed red corpuscle and others contained dark granules. These cells were not limited to the enclosed spaces but occurred throughout the organ. There were in addition multinucleated cells like myeloplasts and an occasional eosinophil granular cell with a small round deeply staining nucleus. The Malpighian bodies were diminished in size and showed no changes in the germ centres. There was slight general increase of fibrous tissue and a few areas of hæmorrhage. The infarcted portion was of the same nature in a condition of coagulation necrosis. No abnormal cells could be found either in the liver or kidneys, and there was no fatty change in either. Some of the liver cells were foamy, but no doubly refracting material could be demonstrated. The cervical and some of the abdominal lymph glands presented similar changes to those in the spleen—i.e., there was an invasion of the follicles by large mononuclear cells with poorly staining and vacuolated protoplasm. They had no special arrangement and did not appear in the vessels. No multinuclear cells were present.

These histological findings correspond to those reported in other cases, though some observers deny phagocytosis, and here we find ingestion of red corpuscles; and in no other instance has necrosis been recorded. As in all the other specimens, except one of Mandelbaum's, the lymphoid tissue is diminished. The clinical interest of the case lies in the youthful age of the patient and in its rapid course. The onset was acute and the child lived only three weeks, having been remarkably well just before. Most cases of this disease are very chronic in course, and when it occurs in children it usually leads to progressive anæmia and emaciation and not to sudden death as in this case while the nutrition was still good. The blood picture is characteristic and differentiates from von Jaksch anæmia with its myelocytes. It differs by showing a slight leucocytosis instead of the usual leucopenia, but as there are no other signs of lymphatic proliferation it is possible that it was a terminal event, and that earlier counts might have been lower. The only other peculiarities are a liver that is not enlarged and the absence of gross hæmorrhages. Nearly all previous cases have suffered from epistaxis; in this patient there was no bleeding, but the petechiæ on the abdomen seem to have been authentic and were confirmed by several observers.

In spite of these variations from some of the cardinal signs and symptoms, the histology of the spleen, upon which, after all, the diagnosis of Gaucher's disease depends, is sufficiently true to type to make an example of this rare condition worth recording. I am indebted to Dr. W. E. Robinson for permission to do so.

Medical Societies.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING of this Society was held at the Royal Army Medical College, Millbank, on July 11th and 12th, Lieut.-Col. H. MARRIAN PERRY, R.A.M.C., being in the chair.

J. W. MCLEOD, W. MACADAM, and B. WHEATLEY (Leeds) discussed the possible significance of hæmolytic intestinal bacteria in the causation of anæmia. Hæmolytic streptococci are rare in duodenal contents, and they thought that attention might profitably be directed to the hæmolytic hæmophilic organisms which are found in about 55 per cent. of normal throats and in some cases in the bowel.

R. CRUICKSHANK (Glasgow) described the ill-understood *Bacillus lipidus*, especially in respect of its occurrence in the stools of infants and its relation to changes in reaction.

C. H. BROWNING and R. GULBRAUSEN (Glasgow) had found that the acid-fastness of the tubercle bacillus could be readily removed by fat solvents which were acid—e.g., trichlorethylene—or neutral solvents (such as chloroform) to which minute amounts of acid had been added, leaving well-formed ghosts behind.

H. A. HAIG (Cardiff) described two cases of streptothrix infection: one beginning in the appendix and spreading over the abdomen, due to *Nocardia israeli* and successfully treated with potassium iodide; the other, caused by *Actinomyces bovis*, commencing in a rib and spreading through the thorax to the brain with involvement of the heart, which is very rare.

J. K. CLARKE (London) had experienced two cases of subacute infective endocarditis from which he has isolated by blood culture *Streptococcus mutans*, the pleomorphic organism constantly associated with the early lesions of dental caries.

H. W. CROWE (Harrogate) demonstrated the characteristic colonies of the different streptococci grown on his chocolate medium, correlated the groups thus defined with those described by other workers, and outlined a scheme of classification.

G. C. CAMERON and H. B. MAITLAND (Toronto) described the course of a transmissible rabbit encephalitis which they had met with, and C. DA FANO (London) detailed the microscopical characters of the parasite (apparently a microsporidium) with some very clear lantern slides.

J. M. BEATTIE (Liverpool) dealt in a comprehensive way with his experiments on foot-and-mouth disease in rats. The original virus came from the lymphatic glands of cattle which had been in contact with infected animals and was carried successfully from rat to rat through three passages with dorsal œdema of the feet, and vesicles on the feet and tongue as characteristic symptoms. The animals also showed a peculiar gelatinous œdema of lung which he had found in wild rats, especially in areas of Liverpool, in possible contact or communication with places where frank bovine foot-and-mouth disease had occurred. These wild rats, however, failed to infect normal experimental rats, and the opinion was generally expressed in the discussion which followed that whether the lung condition had anything to do with foot-and-mouth disease or not, it was commonly found in adult laboratory and wild rats in many places.

W. J. WILSON, J. H. DUNN, and E. M. MCV. BLAIR (Belfast), in extensive observations of the influenza epidemics of 1919, 1922, and 1924, found the serum of influenza cases to agglutinate Pfeiffer's bacillus freely and almost constantly, the reaction being manifest in the first few days of the disease and disappearing soon after defervescence. The most important point is to have an emulsion which is readily agglutinable, and this can be tested with sera preserved from times of epidemic prevalence by the addition of an equal volume of glycerine. Many controls and 25 cases of lethargic encephalitis gave negative results, except in a few cases of pulmonary tuberculosis, bronchitis, and pneumonia.

E. G. D. MURRAY (Cambridge) showed what a great influence the composition of the culture medium might have on the virulence of the meningococcus; amino-acids are important, but the results cannot be accurately predicted and have to be obtained by direct animal test in each case.

F. W. ANDREWES (London) showed how the relative quantities of specific and group agglutinins could be accurately evaluated in bacteria of the Salmonella group by graded quantitative absorption.

P. HARTLEY (London) showed that antigens and antibodies in serum could be satisfactorily preserved as dry preparations by precipitation with ether-alcohol mixtures in the cold and reconstituted by solution in water. In the system horse-serum-horse-precipitin, ether extraction of either component made little or no difference in the result, but if both were used in the extracted state no precipitate was formed. The same author also described experiments showing that radiation with ultra-violet light or the carbon arc did not enhance the capacity of guinea-pigs to produce antitoxin or rabbits to generate typhoid agglutinins, consonantly with the recent finding that the increase in the bactericidal power of the blood caused by radiation is due to influence on the phagocytes.

C. C. OKELL and E. E. BAXTER (London) described their experiments with the toxin of the Dick and Dochez streptococci used in the manner of the Schick test to measure susceptibility to scarlet fever. The toxin is neutralised with the serum of scarlet fever convalescents. No animal gives satisfactory results. Their tests showed fairly good correspondence with the clinical histories.

W. MAIR (London) suggested that it was premature to conclude that the reaction was a test for susceptibility to scarlet fever as well as a test for susceptibility to the toxin of these particular streptococci.

D. B. STEABBEN (London) found that metallic sols, gelatin, agar, peptone, and other colloids characteristically led to an immediate concentration of the blood and leucopenia followed by a leucocytosis —a response not given by crystalloid substances. The colloids had no effect on an existing antibody content, but there was some indication that they improved the response to a fresh dose of antigen.

J. MCINTOSH and L. E. H. WHITBY (London) had made further attempts to stimulate antibody production with salts of lead manganese and beryllium with completely negative results.

R. A. WEBB (Cambridge) found that an intravenous dose of meningococci given within 24 hours of another bacterial antigen resulted in sudden death with epileptiform convulsions.

A. PINEY and A. B. ROSHER (London) failed to find any relation between antibody production and lymphocyte response in the blood.

S. P. BEDSON (London) in guinea-pigs found that splenectomy led to an increase in blood platelets to about twice their normal number for about a month. During this period antiplatelet serum will reduce the number of platelets as in normal animals and will give purpura if the dose is large enough.

M. E. JOHNSTON (London) had worked out in detail the immunity to antiplatelet serum and had found no evidence of the existence of anti-antibodies.

P. HARTLEY mentioned anaphylactic experiments which led to the same conclusion.

J. F. GASKELL (Cambridge) showed that to produce lobar pneumonia in rabbits a small intratracheal dose of highly virulent pneumococci was necessary; larger doses led to general infection of the serous cavities.

J. C. G. LEDINGHAM (London) emphasised the fact that the reaction to vaccinia is essentially in the reticulo-endothelial system; it has no special affinity for epidermis.

J. A. Arkwright and S. S. Zilva (London) found that a lowering diet, qualitatively or quantitatively, much diminished the inflammatory response to diphtheria toxin and other skin irritants.

A. Leitch (London) had made many experiments by putting gall-stones, sterilised pebbles, pillules of pitch &c., into the gall-bladder of guinea-pigs; the animals mostly died in 6-12 months, and in a number of cases showed hypertrophic epithelial growth which in some instances was frankly invasive and malignant.

B. R. G. Russell (London) showed that spontaneous mouse cancer exhibited the same activity in pentose metabolism as the transplanted tumours.

A. Piney described a case of plasma-cell leukæmia, but hardly convinced the meeting that his interpretation of the nature of the cells was correct.

J. S. Dunn, A. Haworth, and N. A. Jones (Manchester) described the anatomy and histology of experimental oxalate nephritis and correlated the excretion of urine and urea and the blood-urea with the anatomical changes.

J. S. Dunn mentioned a case of pulmonary embolism with marrow tissue in a rabbit which had fractured several vertebræ.

G. H. Wilson (Birmingham) described an example of the rare pyelitis cystica in which submucous epithelial nests, arising possibly from inflammatory distortions, degenerate and leave multiple small cysts in the urinary tract.

K. Goadby (London) demonstrated the lung of a Cumberland ironstone miner who died of phthisis with an X ray picture of his chest taken five years previously.

G. L. Cheatle (London) showed a section through the whole breast in Paget's disease; G. Hadfield (Bristol) a suprarenal tumour associated with virilism; T. Lumsden (London) mammalian tissues growing in pure serum of the right reaction in vitro; T. S. P. Strangeways (Cambridge) in vitro tissue cultures showing inflammatory cytological changes; G. H. Wilson a lithopædion; G. S. Williamson (London) his method of mounting museum specimens in celloidin jars; H. M. Perry and J. A. Manifold (London) a variety of pathological specimens, and N. S. Lucas (London) osteitis deformans in a kinkajou, primary carcinoma of the liver in an oryx, leukæmia in an ocelot, and bone formation with bone-marrow in the aorta of a cockatoo from the Zoo.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

A meeting of this Society was held on July 2nd, Sir David Wallace, K.B.E., the President, being in the chair.

Dr. Robert Hutchison opened a discussion on

Visceroptosis.

He said that this subject was of interest not only to the anatomist, the pathologist, the neurologist, and the psycho-neurologist, but also to the physician, surgeon, and gynæcologist; yet its genesis was still little understood, and its diagnosis and treatment were still complicated by practical problems. The practitioner saw much of this condition, especially amongst women. Dr. Hutchison classified visceroptosis under two heads—viz., the so-called congenital (or "virginal") and the acquired ("maternal") types. Many reasons had been put forward from time to time to explain its greater frequency in women, but such influences as poor muscular development due to insufficient exercise, tight lacing, straining as the result of constipation, the shallow pelvis, and bad posture were in themselves not sufficient to produce drooping of the viscera or a train of symptoms. Dr. Hutchison was inclined to regard the condition more as part of a general state. These patients, who were lacking in muscular tone, showed other evidences than merely a drooping of the abdominal contents. Stiller's description of the "Morbus asthenicus" or "Habitus ptoticus" was referred to, and the speaker believed that this gave a fuller and clearer idea of the condition. Reference was also made to the work done on this subject by Sir Arthur Keith. As a physician the speaker had rarely met with the so-called virginal type amongst children, and he doubted very much if the condition was really congenital; but in this connexion he was anxious to have the opinion of a surgeon who was accustomed to perform laparotomies on children. The acquired form was more common, and he referred to the well-known factors in its production, such as weakening of the pelvic floor, stretching of the abdominal muscles, and absorption of the abdominal fat. Of bands and kinks Dr. Hutchison thought that these had a congenital origin and were not the result of stress and strain; but here again a surgical opinion would be helpful. With regard to the symptomatology, it was a question whether visceroptosis per se was capable of producing symptoms, but the improvement which was so commonly found in congenital cases, when these women became pregnant, favoured the belief that the mechanical results of dropping of the abdominal viscera could not be altogether ignored. At the same time, every practitioner was constantly meeting with cases of the acquired variety who were entirely free from symptoms. This led Dr. Hutchison to the conclusion that besides the actual dropping of the viscera there must be other factors present before symptoms were produced. Walton's view was that the presence of bands causing kinks in the gut was the direct cause of the symptoms, but division of the bands did not always give the patient relief, and Dr. Hutchison believed that functional incapacity of certain organs must also be considered as a causal factor. Visceroptotic patients frequently suffered from atony of the bowel, and deficient secretion of gastric juice, and these conditions must also be considered as a means whereby symptoms were produced. The relation of visceroptosis to neurasthenia and the neuroses was of great importance, and this immediately raised the question: Does visceroptosis cause neurasthenia or are both manifestations of the "Morbus asthenicus"? It was common knowledge that depressing emotions lowered visceral tone, and this in itself was apt to set up a vicious circle. It was really a question whether the drooping and atony of the bowel could lead to the mental depression and loss of emotional tone, as the two coexisted so frequently. These patients were often so introspective that it might be concluded that their abdominal complaints were only a cloak for some concealed mental conflict, and that in reality they were suffering from an anxiety neurosis. The physician was too apt to neglect this side of the picture. Though the diagnosis of visceroptosis was easy, the real problem at the bedside was to confirm the opinion that the symptoms were the direct result of it. There was always the possibility that the visceroptotic abdomen might also be the seat of organic disease. Visceroptosis was a great mimic, and all the known means of physical diagnosis should be employed. Finally, if any doubt existed, Dr. Hutchison recommended surgical exploration, the object in view being fully explained to the patient. From his experience of these cases the speaker did not believe that visceroptosis, per se, produced such organic conditions as gastric and duodenal ulcers, but he was inclined to think that gall-stones might follow on it. With regard to treatment, the mental factor was, perhaps, the most important, and at the same time the most difficult. He was in general agreement with the usual lines of medical treatment. The fattening cure had its ardent supporters, and there was no doubt that, combined with the usual physical treatments and abdominal supports, it often gave good results. The early detection of these cases was of importance, for they were then more responsive to treatment. He did not consider a case cured until there was an absence of symptoms for at least five years. Referring briefly to surgical treatment, Dr. Hutchison doubted very much the value of fixation operations.

Mr. JOHN FRASER said that in his experience intussusception only occurred in those children who were the subjects of visceroptosis, and this led him to the belief that the condition was congenital in origin. He referred to the embryology of the intestinal canal, and pointed out that the sympathetic nervous system was probably deficient in this variety of visceroptosis.

Prof. WILLIAM RUSSELL said that the importance of testing the functional capacity of the stomach in these cases could not be over-rated. It was essential to treat patients along these lines, and he agreed with the view that repeated pregnancies tended to produce the condition.

Sir HAROLD STILES was in complete agreement with Mr. Fraser as to the congenital origin of the condition. It was his custom to recommend proper physical training in such cases, with good results. Many cases exhibited a loss of balance between the vagus and sympathetic nerve-supply. He would only operate on the visceroptotic patient at the expressed desire of the physician, and then as a last resort.

Dr. HAIG FERGUSON, speaking as a gynæcologist, said that surgical interference was always necessary, because ligaments had been stretched, and this gave rise to ptosis, which in its turn was responsible for the marked constipation. Obstetricians had been blamed for much, but though he was against early rising after parturition, he encouraged his patients to move about gradually in bed, and by the use of graded muscular exercises loss of tone was prevented. Ptosis of the kidney was frequent in thin women after childbearing, and he had found the fattening cure particularly useful in this condition.

Prof. EDWIN BRAMWELL laid special emphasis on the psycho-neurological aspect of visceroptosis. They were admittedly difficult cases to handle, but only harm was done by those who attempted to explain away symptoms on purely anatomical evidence.

Prof. D. P. D. WILKIE said that there was some confusion of thought regarding visceroptosis in childhood. The motile cæcum, to which reference had been made, could be regarded either as a local condition which might be dealt with surgically, or as part of a general visceroptosis, and in this latter condition local surgical treatment was of no value.

Mr. W. A. COCHRANE described briefly the statics of visceroptosis, and showed how much could be done by correct posture and suitable exercises.

Dr. FREDERICK PORTER inquired whether trauma could be a factor in the production of visceroptosis.

Dr. HUTCHISON, replying, said in his experience he was convinced that visceroptosis was uncommon in children, and to the last speaker's query he would say that he did not think that trauma could be a factor in the production of this condition.

Exhibition of Clinical Cases.

Sir HAROLD STILES demonstrated two cases after operation for acoustic tumours. He described briefly the clinical findings in each case, and described his operative technique. A patient after operation for a spinal root tumour was also shown. This man had been regarded as an atypical case of progressive muscular atrophy, and at operation a vascular tumour was successfully removed. Since then there had been a steady improvement in all the symptoms and the patient was now able to walk.

Mr. J. W. STRUTHERS showed a case of multiple exostoses. Keith had suggested the name diaphyseal aclasis for this condition. Emphasising the importance of a thorough investigation of all cases of hæmaturia, however transient, Mr. Struthers showed two patients after removal of malignant tumours of the kidney, in whom the earliest sign had been the passage of blood in the urine, and this at the first onset had not been fully investigated. He also showed specimens from a case in which a patient suffered from fracture of the femur, paraplegia, &c., due to secondary deposits from a small "latent" malignant tumour.

Reviews and Notices of Books.

CRIME AND INSANITY.

By W. C. SULLIVAN, M.D., Medical Superintendent, Broadmoor Criminal Lunatic Asylum. London: Edward Arnold and Co. 1924. Pp. 259. 12*s.* 6*d.*

Dr. Sullivan follows closely the principle that the only method of investigating the relation of psychopathology to crime is the clinical examination of the *individual criminal*, and he arranges his ample material in accordance with the form of the mental disorder present. The modes of reaction peculiar to alcholism, dementia præcox, epilepsy and systematised delusional insanity are shown by case-histories not only of clinical but of psychological interest. The sufferer from dementia præcox, for example, may recognise the homicidal impulse as independent of and irrelevant to the rest of his conscious personality, and the lucid accounts given by such patients, often without attempt at excuse or rationalisation, offer a fascinating problem in psychology and give point to a later remark that the McNaghten rules would make most insane criminals fully responsible. The author affirms that whilst alcoholism is the most important of the individual morbid factors of crime, yet it is of very small account in the insanity of the asylum. The fluctuations of psychiatric doctrine now place in the dementia præcox group most of the cases formerly described as paranoia; yet paranoia has exerted an unfortunate influence on legal conceptions of morbid psychology, which attribute a grossly exaggerated importance to delusion and ignore almost entirely the primary and dominant influence of morbid impulse. It is noteworthy that, although epilepsy often serves where a defence of insanity would be otherwise feeble, the incidence of epilepsy is the same in the criminal lunatic population as in the inmates of ordinary asylums.

In the excellent chapter on transitory mental disorders attention is paid to the genuineness of the amnesia so often claimed, but the possibility of restoring the lost memories is not considered, and the generalisation that the most emotional impressions in neurotic dream states are more likely to be retained (perhaps one should say "*recalled*") does not agree with the findings in the numerous amnesias after "shell-shock." The use of statistics of criminal lunacy to confirm the view that the psychopathological factor is of little importance in acquisitive crime unduly narrows the meaning of "psychopathological" and excludes those mental disturbances which lead to minor delinquencies. It is plain, however, that the cases of this nature described by Dr. Hamblin Smith in his "Psychology of the Criminal" are not only in a legal category different from that in which Dr. Sullivan's are placed, but differ also in being accessible to treatment by analysis. The legal conception of insanity, therefore, is correlated with some fundamental psychological condition. A hint of the nature of this condition is supplied by Dr. Sullivan when he notes a relation between the behaviour of the dementia præcox patient and the Freudian theory of the Œdipus complex. It seems as if these patients live in the world of unconscious fantasy, whilst the merely psycho-neurotic—like Dr. Hamblin Smith's subjects—are influenced by unconscious fantasy but are able to judge it by reality standards when it is revealed to them by analysis.

The study of clinical material leads of course to the question of responsibility, and Dr. Sullivan claims for psychiatry only the right to ask how far the legal criteria of responsibility are adapted to secure the ends which the law has in establishing them. The question reveals a tangle of inconsistencies created by our inheritance of the belief that disorder of intellect is the sole criterion of insanity. The difficulties of the McNaghten test have been circumvented by evasion or distortion of the legal formula, and the result of the test itself may be abrogated by the statutory inquiry prescribed in cases where the Secretary of State has reason to believe that a prisoner under sentence of death is insane. Following upon the case of R. v. True, the Atkin Committee recommended that irresistible impulse should exclude responsibility, but Dr. Sullivan shows that even with this addition to the test the ends of the law are not attained. The content of the delusion is still a criterion, and the lunatic is still responsible who murders a supposed persecutor under the delusion that his fancied enemy is reading his thoughts. The author's remedy for this curious product of legal psychology and for other difficulties is to replace *ex parte* evidence, given in the form of artificial and fragmentary replies to more or less relevant questions, by a full and connected statement by impartial witnesses. This would reach at the outset the result now attained by the tedious stages of trial, appeal, and revision by the Secretary of State.

Dr. Sullivan writes with well-earned authority and the book is an important and valuable one. It should receive the attention of all to whom an understanding of the subject is necessary.

THE NERVOUS CHILD.

Third Edition. By H. C. CAMERON, M.D., F.R.C.P., Physician in Charge of Children's Department, Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1924. Pp. 233. 7*s.* 6*d.*

THE two previous editions of this book have already won for it an established place in the literature of children's diseases. The third edition, which now appears as a further testimony to the popularity of the work, contains relatively little new matter. Additions have been made to the chapter dealing with various signs of nervousness. The chief alterations are found in the chapter on Nervousness and Physique, which has been enlarged and enriched by a series of excellent photographs illustrating the types described, among others, the type to which Dr. Cameron has given the name of "status catarrhalis." It is not altogether easy to understand the author's reluctance to class these cases as rickets because of the inconstancy of bony changes; moreover, it seems to be of some importance that both parents and medical men should recognise that the factors in the production of this type are those of rickets—nutritional and environmental—rather than hereditary, as in so many other types of nervous children.

This book contains a large amount of material for which place cannot be found in a general textbook, and will continue to be of the greatest value in providing the practitioner with a practical scheme for the regulation of the child's environment.

AN INTERNATIONAL YEAR-BOOK OF CHILD CARE AND PROTECTION.

Compiled from Official Sources by EDWARD FULLER. London: Longmans, Green and Co. 1924. Pp. 448. 7*s.* 6*d.*

MR. FULLER, who is editor of the *World's Children*, has compiled this year-book from official sources with the intention of providing as complete a record as possible of State and voluntary effort for the welfare of the child, including education, care of the delinquent and destitute, and conditions of juvenile employment throughout the world. The year-book is published for the Save the Children Fund and contains an introduction by Mr. Percy Alden, M.P., chairman of this fund and hon. secretary of the British Institute of Social Service. An attempt has been made to deal with all the countries scheduled on a uniform plan, although this aim has been impeded by the fact that in a number of countries the term "child welfare" is so construed as to include the care of destitute children, undertaken here by the Poor-law [illegible] national agreements and laws relating to child life is included, and the Declaration of Geneva. Inequality is inevitable in the first appearance of a new and comprehensive work of this kind, and Mr. Fuller would welcome (at 26, Gordon-street, London, W.C.) criticisms and suggestions from readers for a later edition. The attempted compilation of names to form "An International Who's Who" is not feasible; such a list would be of value for reference at the offices of the Fund, but glaring errors of omission or commission can hardly be avoided. The year-book will be used wherever the particular interests of children come up for consideration.

THE PHYSIOLOGY OF COLOUR RESPONSE.

The Pigmentary Effector System. By L. T. HOGBEN. Edinburgh: Oliver and Boyd. 1924. With 17 figures in the text. Pp. 152. 10*s.* 6*d.*

BY the "pigmentary effector system" the author means the apparatus by which animals such as chameleons, frogs, and fishes change their colours, which they do mostly in relation to changes in the colour and illumination of their surroundings. The change is generally brought about by movements of the pigment granules which are contained in special branched cells in the skin, though it is not certain whether the whole cell contracts or expands or whether the granules move inside the cell. An ordinary frog in dry white warm surroundings in a bright light is quite pale; the pigment granules are collected together in small isolated masses. In a wet, black, cold, and dusky environment the same animal in about a couple of days becomes black owing to the dispersion of the granules throughout the cells which contain them. The author, with Mr. F. R. Winton, has shown that the reaction is in this case under the control of the pituitary. The middle and posterior lobes contain a substance which induces expansion of the pigment and darkening of the skin; the reaction is of such delicacy that it would seem of likely utility in the pharmacological assay of pituitary extracts. Frogs from which the pituitary has been removed become and remain permanently pale with contracted pigment; they may be darkened by the injection of pituitary extract. In reptiles the responses are rather different and adrenalin has at least a considerable share in bringing them about. In fishes the nervous system plays an important part. In crustacea the pigment-bearing cells are multicellular organs with, in some cases, a variety of pigments which behave differently under different circumstances.

We have here a most interesting account of a phenomenon which in one form or another is widespread. The book is the first of a series of biological monographs and manuals under the editorship of Dr. F. A. E. Crew, of Edinburgh, and Mr. D. W. Cutler, of Rothamsted, and if the succeeding volumes reach the same standard they will be useful additions to scientific literature. The publishers might reconsider the format; the type and pages are too big.

INCOMPATIBILITY IN PRESCRIPTIONS, AND HOW TO AVOID IT.

By THOS. STEPHENSON, D.Sc. Edinburgh: *Prescriber* Office. 1924. Pp. 32. 1*s.* 6*d.*

THIS pamphlet is a reprint of articles contributed to *The Prescriber* by its editor, together with some additional matter.

A definition of incompatibility is quoted as "any unintentional change which notably interferes with the elegance, usefulness, or safety of a prescription," and such changes are grouped into three classes: (1) chemical, (2) physical or pharmaceutical, and (3) therapeutic, though both chemical and physical changes might be described as pharmaceutical. Cases of chemical incompatibility are fully and systematically described as occurring when: (*a*) an insoluble compound is precipitated; (*b*) gas is evolved; (*c*) an acid and an alkaline substance are mixed; (*d*) one of the ingredients is decomposed; (*e*) an alkaloid is precipitated ; (*f*) an undesirable compound is formed. Each section is discussed in detail, and all likely cases of incompatibility are indicated. Perhaps the most noteworthy feature is the inclusion of a sub-section dealing with explosive reactions. This should be of great value to all physicians and practitioners, many prescriptions being quoted of which the extremely dangerous nature might easily be overlooked. Potassium chlorate and other oxidising agents are the most likely causes of trouble in this respect. Although nitroglycerine is safe in 1 per cent. alcoholic solution, the latter on dilution deposits the nitroglycerine as an oil, which is very highly explosive. The safest method of prescribing nitroglycerine, therefore, is in chocolate tablets. Cases of physical incompatibility are classified under the headings of: (*a*) insolubility ; (*b*) immiscibility ; (*c*) undesirable colour change ; (*d*) unsuitable consistence or excessive bulk ; (*e*) molecular change, as formation of liquid on mixing solids. A brief section deals with therapeutic incompatibility, and a very useful table of incompatibilities of all the usual drugs is given. An adequate index forms a valuable addition too often omitted from short works of this type.

The statement that acetyl-salicylic acid (aspirin) decomposes potassium iodide with liberation of iodine requires qualification, as this reaction cannot take place if both substances are reasonably pure. On p. 21 we find: "Many of the water-soluble metallic salts, and especially those that are deliquescent, are insoluble in alcohol, and the addition of any spiritous preparation, such as a tincture, often throws such salts out of solution." This is quite true, except for the words "those that are deliquescent," as actually it is the non-deliquescent salts which are least soluble in alcohol. The author states, with a certain amount of scepticism, that "sodium bicarbonate is also said to convert calomel into corrosive sublimate, but no toxic effects appear to have been observed from such a combination." The scepticism is certainly justified.

The pamphlet gives in a convenient form and at a low price information which at any time may be of the greatest value. The subject is of importance to those who prescribe and those who dispense, and it is possibly of even greater moment to the former, as they are less likely to be made aware of the incompatibility by seeing its results themselves. This practical little work should prevent them from falling into any of the pitfalls.

Handbuch der Biologischen Arbeitsmethoden.

Edited by Prof. Dr. Emil Abderhalden. Berlin: Urban und Schwarzenberg. Section 112, Verdauungsapparat. Swiss Fr.19·9. Section 122, Untersuchungen an einzelligen Lebewesen. Swiss Fr.7·5. Section 125, Immunitätsforschung. Swiss Fr.4·5. Section 126, Untersuchungen des Harns. Swiss Fr.4·8. Section 127, Nahrungs- und Genussmitteluntersuchungen. Swiss Fr.11·4. Section 128, Die Methoden der Medizinescher Statistik. Swiss Fr.7·8. Section 129, Funktionen Bestemmeter Organe. Swiss Fr.7·5.

Of the six sections of this admirable system recently published, Section 112 deals with the investigation of saliva, fæces, intestinal gases, and gastric contents. Minute details are given with regard to academic investigations. The more modern clinical investigations are less well covered ; thus there is in the section dealing with fæces no reference to the microscopic appearance. Again, in the description of the methods of examining gastric contents modern work on the fractional methods of investigation is not mentioned. Section 122 contains detailed accounts of the various methods of investigating unicellular organisms of the plant and animal kingdom and a good account of staining and microscopic methods is given. The part dealing with microscopic research is full, and contains descriptions of many useful techniques. But it is for Section 125 of the series that the handbook is best known to the pathologist and bacteriologist. The volume under review contains an account of the methods of demonstrating the Pfeiffer phenomena and of the preparation of bactericidal sera, and also an account of the von Pirquet reaction ; its contents are of great practical value to laboratory workers in pathology. Section 126 is devoted to the chemistry of various amine bodies in urine and forms a complete and exhaustive treatise on the subject. Although outside the sphere of ordinary biochemical work, this volume would prove of the greatest value to any person working at this particular branch. Section 127 contains descriptions of methods of investigating alcoholic beverages and tobacco. The descriptions are of a purely technical nature and, as elsewhere, the treatment of the subject is exhaustive. Section 128 opens the part of the work dealing with medical statistics. It commences with a general account of the subject and then proceeds to describe the various methods used in the German State Departments for working out the various statistical records such as death-rates and birth-rates. It is interesting to contrast the German methods and findings with those in this country. Section 129 is of particular interest since it describes the methods of investigating, by animal experiments, various organs such as the pituitary and suprarenals. Detailed accounts are given for the methods of extirpation of these organs and an excellent series of photographs demonstrating the results in various animals. The accounts, therefore, are likely to interest physiologists. In no other single volume is it possible to obtain descriptions of these operations, and sound pharmacological information is also provided. Altogether, it is difficult to praise too highly the industry and sense of balance shown in the compiling of this great work.

Précis de Chimie Physique.

By H. Vigneron. Paris: Masson et Cie. 1924. Pp. 403. Fr.30.

This little volume deals with physiological chemistry in a very efficient manner and the mathematics are kept within such bounds as could be understood by most readers. Very good accounts are given of Langmuir's theories and also of the application of the Le Chatelier theorem. The section dealing with the theory of ions, and particularly hydrogen-ion concentration, is disappointing, and in parts almost unintelligible. On the whole, however, the explanations are clear and the line drawings are particularly useful.

Anatomy of the Teeth.

The Microscopic and General Anatomy of the Teeth, Human and Comparative. Second edition. By J. Howard Mummery, C.B.E., F.R.C.S., L.D.S. London: Humphrey Milford, Oxford University Press. 1924. Pp. 618. 35*s.*

So much new matter appears in this new edition of Mr. Mummery's well-known book that it must be considered as a fresh publication. The book is nearly doubled in size by the addition of a section dealing with the macroscopic human and comparative anatomy of the teeth. Thus the whole syllabus in dental anatomy required for the L.D.S. and other dental degrees is comprised in one volume. This will undoubtedly prove a great convenience to the student who hitherto, if he has wished to use this book, has been compelled to purchase in addition some other book dealing with comparative dental anatomy.

The first part, covering the microscopic anatomy of the teeth, is not very different from this section of the work as it appeared in the first edition. The chapters on calcification have been rearranged and should help the student to understand better this very difficult subject. An account of the author's discovery of vaso-motor fibres to the vessels of the pulp is included. The second part of the book commences with an admirable description of the anatomy of the human teeth. The tendency is for examiners to lay a greater stress on a knowledge of the teeth of man. They rightly expect the student to know them in detail, for without such knowledge the practice of dentistry must be empirical. The illustrations to this section are extremely good; indeed, they are the best we have ever seen. The various theories of tooth development are described in considerable detail, and include Bolk's dimeric theory. Mr. Mummery has wisely not attempted to describe the dentition of the vertebrates in detail. Such knowledge is not necessary to a dental student. The inclusion of this subject in the syllabus is designed to illustrate the process of evolution by reference to the teeth, which exemplify the nature of adaptive modification almost better than any other structure. A broad sketch which emphasises those aspects of evolutionary significance but omits minor details of less importance is just what is required in a book of this kind, and Mr. Mummery supplies it. The account of the evolution of the dentitions of the horse and elephant, for instance, is excellent. The illustrations are produced on plates printed on art paper instead of being interspersed in the text. They are all original drawings and are extremely good. The book is singularly free from errors. "Thalycine" should, of course, be thylacine. A full index curiously enough omits any reference to the dental pulp.

A special word of praise is due to the publishers for the way in which they have produced the book.

THE DEVELOPMENT OF THE HUMAN BODY.

Seventh edition. By J. PLAYFAIR MCMURRICH, Professor of Anatomy in the University of Toronto. London: Henry Kimpton. 1924. Pp. 506. 18s.

THIS book has gained a prominent place among works on human development by reason of its clear expositions and of the large amount of information contained in it. The present edition, although it has been altered in some ways, shows no diminution in these excellent qualities, and we observe a number of new illustrations. There are a few slips in the editing of the book which might have been avoided—for example, the reference on p. 488 to Fig. 285 ought to be 288, and in Fig. 186 the subject discloses an affection for standing on its head which we imagine is really not intended by the writer. In spite of the fact that in some details the accounts of development are not quite those adopted in English text-books—possibly owing to the author's decided preference for German work—the seventh edition of Prof. McMurrich's little book can be heartily recommended to those who wish to obtain a comprehensible and fairly comprehensive view of the matter of which it treats.

RESEARCH IN DAIRYING:

OPENING OF THE NATIONAL INSTITUTE.

ON July 19th the formal opening took place of the National Institute for Research in Dairying at Shinfield, near Reading, when a large company representative of those interested in dairy problems were entertained by Lord Elveden, chairman of the governing board. When a scheme of agricultural research was formulated under the Development and Road Improvement Fund Act, 1909, by the Board of Agriculture, Reading was chosen as the centre for dairy investigations, and in 1912 the Research Institute in Dairying was established at University College, Reading. At the outset the Institute had to depend for its material on supplies from the College farm and the British Dairy Institute of the College, but in October, 1920, the Shinfield Manor Estate of about 350 acres was secured, and an experimental farm was started with the farm buildings then in existence. In June of the following year, by means of a grant from the Development Commissioners and private donations, the purchase of the estate was completed and the general control of the Institute delegated to a governing board, on which, in addition to the Ministry of Agriculture and the Ministry of Health, several other important agricultural interests were represented. At this time the Institute adopted the title it now bears. Shinfield Manor House has been transformed into a series of laboratories and offices, and additional buildings have been erected at a cost of about £30,000. Towards this sum a grant of £13,000 was made by the Development Commissioners, and the balance is being raised by public appeal.

The Laboratories.

The new laboratories contain a chemical department where work on accessory food factors, as, for example, the source of vitamin A in butter, and investigations into the nature and causes of abnormal milks, and the effect of heat on milk are carried out. In the bacteriological department, under the direction of Dr. R. Stenhouse Williams, investigations are at present being undertaken into such problems as the relative efficiency of steam and dairy disinfectants in sterilising dairy utensils, and the importance of *B. coli* content of milk and its effect on the keeping quality of the milk. The additional new buildings include a dairy, in which an ammonia cold-storage plant has been installed. On the dairy farm a herd of from 40 to 50 cows is maintained, and the new buildings in connexion with this branch of the Institute's activities comprise food stores, granaries, and cowsheds. The library contains over 2000 books and receives bulletins from various colleges and experimental stations.

The Importance of Research Work.

The opening ceremony was performed by Lady Elveden, and lunch was provided in one of the new cowsheds. The toast of the Ministry of Agriculture and the Development Commissioners was submitted by Mr. W. M. Childs, Principal of the University College, Reading. In reply, Mr. J. F. Blackshaw said that the Ministry and the Commissioners had gladly done all they could to develop the work of the Institute. Generous financial assistance had been rendered by Lord Elveden and funds had also been raised from the industry itself, though in that connexion more difficulty had been experienced than ought to have been the case. Research was of the highest importance to dairy farming if they were successfully to meet the competition of other countries who were engaged in a genuine effort to raise the standard of the industry, both to benefit their own people and to gain a foothold in the British market. Lord Elveden, who presided, in proposing "Prosperity to the Institute," spoke of the future of research in dairying. Around the Institute, he said, there had sprung up an industry which was almost unique—an industry engaged in the supply of wholesome milk from animals that had passed the tuberculin test, which was being sold at prices within the means of even the poorest members of the community. By scientific feeding of the cows it had been possible to produce milk at *2d.* or *3d.* a gallon cheaper than many farmers could produce it, and that result suggested most valuable possibilities. Milk production carried the largest amount of labour on the land, and therefore such research as was being carried out at the Institute opened a vista of increasing national prosperity to the countryside. It was encouraging to note that the principles laid down by the Institute had been adopted by the Government of New Zealand, and that the Dutch, too, were proposing to apply them. All over the country farmers in increasing numbers were now seeking to apply scientific methods in their efforts to produce better cattle, cleaner milk, better cheese, and better butter. Mr. E. Matthews (vice-chairman of the board) and Mr. Holt Thomas replied. At the close of the proceedings it was announced that as the result of an appeal for further donations to the Institute sums amounting to £1070 had been subscribed, which sum Lord Elveden intimated he would double.

THE LANCET.

LONDON: SATURDAY, JULY 26, 1924.

THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

The annual meeting of the British Medical Association was held this year for the first time in a great industrial city of the north containing no medical school of its own, although Bradford medical institutions have excited the keenest interest far beyond its borders. The Lord Mayor of Bradford, in welcoming the Association, asked the members to study the experiments in municipal medicine in which the city took great pride, and full use was made of this invitation, with the result that the municipal hospital and municipal clinics of Bradford are now familiar to many who only had known of them previously as subjects of controversy. The lavish hospitality offered by individual citizens—for hotel accommodation is strictly limited in such a purely business community—also brought about the mutual knowledge needed for sympathetic understanding. It is probable, indeed, that the visit of the Association to Bradford has finally assured the continuance of the friendly relations growing up between the official representatives of medical policy and a city which was honestly desirous of running its socio-medical institutions in its own way. Although without a medical school, Bradford is not without academic distinction in medicine, as Mr. Basil Hall, President-elect of the Association, was at pains to point out in his inaugural address. It is natural that wool-sorters' disease should have been recognised in a city where wool is the chief means of livelihood, and work is proceeding which should result in the total prevention of anthrax without damage to the commercial value of the wool.

The Representative Body, whose labours we report in part on another page, was inclined to exploit still further its expansive mood of last year. The time is approaching when the new home of the Association in the neighbourhood of Tavistock-square will be ready for occupation, and will provide accommodation for the ever-expanding work of the Association, as well as a conference hall with great decorative promise. The membership of the Association now exceeds 27,000, a high-water mark in absolute numbers, although the actual ratio to the number of names on the Medical Register is not yet quite what it was in 1912, and by means of good staff work a large percentage—in some centres almost all—of the newly qualified men and women are being brought into the fold. Consideration of these facts made the Representative Body ambitious to supply all the material needs of its membership. The organisation of benevolent funds and of individual—as distinguished from collective—defence has hitherto been left to other agencies, the devotion and efficiency of which is not questioned. The Representative Body was invited in both instances to refer it to the Council to consider whether these things could not be done and done better by the Association itself, for the Association could no longer afford to remain outside concerns of such vital interest to its members. In the case of benevolent funds the decision was actually taken. The reference in the case of individual defence was only defeated by a very small margin, and feeling in this direction is evidently growing so rapidly that the step is well-nigh a certainty next year. The existing defence societies, which have had a very long start in regard both to time and experience, would hardly find themselves in so good a position as the branch secretaries of the Association for approaching the newly qualified men and women, and for this reason, if for no other, may not remain unwilling to coöperate.

It is now 21 years since the new constitution of the Association came into force, and apart from the activities to which allusion has been made the occasion was thought to demand some formal recognition. The chairman of the Representative Body is accordingly to be provided with some appropriate badge of office. This badge, when it has been designed and produced, will be too late to decorate the retiring chairman, Dr. Wallace Henry, whose services during a number of difficult years have been signal. He will, however, be succeeded in the chair by Dr. H. B. Brackenbury, for so long chairman of the Insurance Acts Committee, Dr. C. O. Hawthorne being elected at the same time as deputy-chairman. The Association is happy in the number of public-spirited men among its members willing to give time and ability in its service.

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TEMPERANCE LEGISLATION.

The Liquor (Popular Control) Bill, which was recently introduced in the House of Lords by the Bishop of Oxford, was rejected by a substantial majority on the motion for its second reading. We do not find it possible to regret this result, for, though the Bill may have been good in parts—and we think it was—its main proposals seem to have been unwisely conceived, if only because their practical effect, if the Bill had become law, would probably have been anything but beneficial to the cause of temperance. The debate on the second reading was so largely concerned either with points of detail, or with the repetition of the rhetoric traditional amongst controversialists on either side of an intricate question, that the fundamental principles of the Bill were inadequately discussed save in two or three speeches, of which that of Lord Dawson was specially noteworthy. While it is right that discussion of a social reform so intimately associated with medicine should receive its most weighty contribution from the only medical man among those taking part in the debate, it is a matter for regret that other speakers, enjoying great opportunities for forming opinions, should have confined themselves to detailed criticism. The provisions of the Bill and the speeches delivered in its support certainly indicated a confusion of ideas regarding the scope and object of temperance legislation—a confusion which might perhaps have been dissipated, to the great advantage of the cause of social reform, had the proposals been more carefully scrutinised, and especially had the standpoint taken allowed of a wider range of inspection. What is remarkable about the Bishop of Oxford's Bill is not any quality of freshness or originality in its proposals—for the principle of local option which it sought to establish is a very old, and hardly a firm, plank of the extreme temperance platform, but rather the fact that such proposals should be seriously advanced as applicable to the liquor problem in this country at the present time. To advocate the policy of local option as a method of abating the evils of alcoholism in this country to-day seems to us to indicate a singular indifference alike to the nature and effect of that policy and to the facts of recent experience in regard to the whole temperance question.

Local option, to have any *raison d'être* at all, presupposes the existence of local diversities of opinion, so that the effect of its adoption would be a partial prohibition, resulting in an irregular patchwork of areas where the sale of alcohol is illegal and of areas where it is permitted, whether under private or public ownership. Now the criticisms of prohibition as an unwarranted extension of legal control over individual liberty, whatever be the value of such criticisms, apply equally to prohibition in large and in small areas. And—which is of more practical importance—the mischievous results which are apt to follow from the legal repression of the sale of alcoholic beverages will certainly not be less, and may be greater, when prohibition is established in a patch fashion over small areas than when it is extended to an entire country. This was a matter of common experience when local option was in force in the United States, and the difficulty of dealing with these evils was, in fact, one of the stock arguments for the wider policy of national prohibition. That similar results would follow from the adoption of this policy in England is foreshadowed by what is found in areas where Sunday closing is in force; and the mischief in this country would be the more deplorable because it would mean the undoing of the most effective and rational scheme which has yet been evolved in the history of temperance legislation. Why, in the discussion of the Bishop of OXFORD's Bill, were the speakers on either side coy in their references to the Licensing Act of 1920, which embodied the essential features of the system of physiological control of the liquor trade, devised by Lord D'ABERNON and enforced by the Central Control Board during the war? Possibly a policy which rejects alike the attitude of laissez-faire in face of a grave and remediable social evil and that of fanatical repression on the score of possible abuses, can hardly be expected to arouse enthusiasm in the clash of contending and equally intemperate opinions. However that may be, the perusal of the debate in the House of Lords certainly left the impression on those medical men who attempt to look at things as they are that the speakers failed to recognise the extent of the change, we may say revolution, which has been brought about in the national alcoholic consumption through the application of the policy of control. Still less does it seem to have been perceived that this policy of control, which has wrought so salutary a change, is wholly irreconcilable with all such attenuated forms of prohibition as local option, Sunday closing, and the like. The system of physiological control was deliberately designed with a view to checking excessive drinking while allowing full opportunity for the safe and temperate use of alcoholic beverages. In pursuit of that aim, the restrictions on the hours and conditions of sale of alcoholic liquor were *arranged so as to avoid any risk of providing* an adequate motive for organising an illicit traffic in [illegible] The practical disappearance of delirium [illegible] rom the wards of the Poor-law infirmaries, [illegible] ous fall in the registered death-rate from [illegible] and from cirrhosis of the liver, the large [illegible] ction in the amount of grave alcoholic crime—all these facts are sufficient proof that the great decrease of public drunkenness under control was not associated with any development of illicit traffic in drink. For it is, of course, the rule, as a priori considerations would suggest and as the experience of America amply proves, that a clandestine trade in liquor is always a trade in concentrated and impure spirits, which are apt to have a specially injurious effect on health, so that any extension of secret distilling or shebeening promptly becomes revealed in the statistical movement of alcoholic disease and mortality. The absence of any such reaction since the enforcement of the policy of control shows quite clearly that the restrictions on the legal hours of sale have always been within the limits of safety; the close times have never been long enough to make systematic violation of the law worth while. A trivial amount of shebeening no doubt exists for the most part in areas under the corrupting influence of Sunday closing, but it is certainly not more frequent than it was before the days of control. And Sunday closing has also to be related to another manifestation of abnormal intemperance—namely, the use of methylated spirits as a substitute for the ordinary alcoholic beverages. It is pointed out in Licensing Statistics for 1922 that, while methylated spirit drinking accounts for only about 0·7 per cent. of the total number of convictions for drunkenness in England and Wales, the proportion of such cases is as high as 21 per cent. in Cardiff, 14 per cent. in Newport (Mon.), and 7 per cent. in Swansea—the chief centres of population which are affected by the partial prohibition of Sunday closing. Such facts as these would seem to suggest that the mixture of temperance policies may be attended with as undesirable results as have been popularly ascribed to the mixing of liquors, and that at all events the advantages which may be obtained by reasonable methods of control are likely to be considerably neutralised when these methods are combined with a partial application of the opposite principle of prohibition.

Within the last ten years the world has seen two great experiments in the legislative treatment of the social problem of alcoholism, and the results are now sufficiently clear to justify a fairly positive opinion as to the respective merits of the two policies which have been tried. In the United States of America it has been sought to remedy the evils of intemperance by absolutely prohibiting the production and sale of alcoholic beverages, by penalising all consumption of alcohol whether moderate or excessive. In this country, on the other hand, the legislature has recognised a distinction between use and abuse, and has limited its interference with the drinking habits of the people to such restrictive measures as will minimise the risk of casual or habitual intemperance. It is possible, of course, that the special conditions of the liquor problem in the United States may be such that the beneficial results of prohibition outweigh its very obvious disadvantages; that is a matter on which foreign opinion might seem impertinent. But it is quite clear that the operation of the system in America has shown that, if applied in this country, its influence for good would be far less efficacious than that of the existing system of control, while its reaction on the health and morale of the population, by its effect in promoting illicit alcoholism and organised defiance of the law, would be highly pernicious. The policy of prohibition, as Lord DAWSON rightly insisted, cannot claim the support of medical science, which condemns the abuse but not the use of alcoholic beverages. If, indeed, the use inevitably entailed the abuse, and if prohibition could really do away with both together, the practical gain might make the policy acceptable on grounds of expediency. But in fact, as the experience of control in this country has clearly shown, it is quite practicable by intelligent regulation to retain the dietetic and convivial consumption of alcohol while eliminating in a very large measure the dangers of excess; and the experience of America has proved to demonstration that prohibition, though it may make moderate drinking illegal, is quite ineffectual in making excessive drinking difficult. With these object-lessons which recent history has brought out so clearly, it is much to be regretted that the zeal of temperance reformers in this country should be wasted in the advocacy of an attenuated type of prohibition, which would not only be futile in itself, but would tend to weaken and pervert the operation of the really effectual policy of control. This latter policy, of course, is still in a stage of imperfect development, and its elaboration and extension will provide ample scope for reforming activity in the future. It may well be, for instance, that its more thorough application will require the transfer of the liquor trade to public ownership. It should help to make clear the true path of progress if we recognise at the outset that local option and other manifestations of the principle of prohibition can have no place in any such programme of reform. Local option is in theory and in effect the negation of the rational and successful system of physiological control.

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ARTIFICIAL PNEUMOTHORAX.

AN interesting stage in the development of any new method of treatment is that in which, after its value has been established, the indications and contra-indications for its employment, and the limitations of its usefulness, are being investigated. Artificial pneumothorax was first employed in the treatment of pulmonary tuberculosis in this country in 1910, over 20 years after its introduction in Italy by FORLANINI. It is now recognised by nearly all workers in tuberculosis here as a valuable addition to treatment, not infrequently helping cases in which the ordinary methods of treatment fail, and restoring to working capacity many patients who otherwise would be condemned at best to chronic invalidism and sooner or later to complete breakdown. The value of artificial pneumothorax is not, however, as widely recognised by the profession at large in this country as its importance deserves; the method is too often regarded as a desperate resort in advanced cases.

We publish this week two interesting papers; the first is by Dr. L. S. T. BURRELL, giving the results of his first 250 cases up to date, and extending and amplifying the information given in the valuable report [1] presented to the Medical Research Council in 1922 by Dr. A. S. MACNALTY and himself; the second paper is by Dr. R. C. WINGFIELD and Dr. G. SELBY WILSON, which forms an admirable complement. This paper deals with the conduct of the cases in which artificial pneumothorax has been employed, correlating certain of the clinical features with the ultimate results obtained. Dr. BURRELL's results show, what might naturally be expected, that the best results are obtained in patients with moderate resistance to the disease, in whom the condition is unilateral. He finds that in bilateral cases although the immediate results of artificial pneumothorax on the more affected side may be good, relapse usually occurs and the late results are unsatisfactory, though life may be considerably prolonged. In the report to the Medical Research Council, Dr. BURRELL gave categorically his views as to the merits and demerits of this form of treatment. In the present paper he emphasises his opinion that early diagnosis in a great majority of cases enables arrest to be achieved by ordinary methods, and that artificial pneumothorax should be considered not as a routine treatment, but as a safe method of resting the diseased part of the lung where ordinary methods fail, so that while it should not be used for early cases, its consideration should not be too long deferred in cases which do not respond to other methods. He discusses the dangers and the complications and shows that they are not serious enough to weigh against the undoubted benefits that it is capable of conferring upon cases properly selected.

The paper by Dr. WINGFIELD and Dr. WILSON deals with 75 cases treated at Frimley Sanatorium, in 60 of which the induction of the pneumothorax was carried out at the Brompton Hospital. They deal specially with the criteria for estimating the effect of this form of treatment, and do not discuss its value or even the details of its application, such as the spacing of the refills or their amounts. Many observations of great interest emerge from the analysis of their cases. Thus the length of time between the induction and the commencement of exercise has varied from 6 days to 285, with an average of 106. These figures should warn us against expecting dramatic results from the treatment. After defining relapse as any condition, whether accompanied by pyrexia or not, necessitating stopping exercise and being put on "rest" for four days or more, the authors find that the longer such a relapse, the worse the ultimate prognosis, and the earlier it occurs after exercise has been started, the less likelihood of an eventual good result. On the other hand, a relapse occurring for the first time when the patient has reached a high grade of exercise is of little importance. They find that better results are obtained in those with a complete collapse than in those in whom partial collapse only has been obtained, but in the absence of details as to the degree of disease before induction, they deprecate the use of their figures as an argument in favour of dividing adhesions. Their views on the value of pneumothorax treatment in bilateral disease are in substantial agreement with those of Dr. BURRELL. They find that an irregular or a periodic temperature in men is an unfavourable indication. One of the great benefits of this form of treatment is the cessation of cough and sputum, or, if sputum persists, the disappearance from it of tubercle bacilli. Dr. WINGFIELD and Dr. WILSON's figures show that when the bacilli persist in the sputum in spite of the treatment the outlook is very unfavourable. As with other modes of treatment gain in weight is a valuable index of the beneficial effect of this treatment. Early loss of weight is of grave import and should lead to a reconsideration of the treatment as a whole. A complication discussed in both papers is that of pleural effusion occurring in the course of artificial pneumothorax. Dr. WINGFIELD and Dr. WILSON maintain that where the effusion is clear and non-purulent it has no influence on the ultimate result, an opinion in which Dr. BURRELL concurs, except that he finds that in cases occurring in association with bilateral disease the outlook is less good and that there is a tendency for the effusion to become purulent. It is allowed in both papers that a purulent effusion is a grave occurrence. Perhaps the most striking result is that in Dr. WINGFIELD and Dr. WILSON's cases, which were an unselected, consecutive series, including a proportion of the late stage or "last resort" types of case, no less than 49 per cent. were restored to working capacity. It is noteworthy that these results were obtained in a sanatorium, and it serves to emphasise Dr. BURRELL's opinion to the effect that artificial pneumothorax is not to be regarded as a cure for pulmonary tuberculosis, but as a safe method of ensuring rest of the diseased part of the lung, to be used in conjunction with other methods of treatment. This seems to us to be the true perspective, and used with due discrimination the induction of artificial pneumothorax will give even better results than at present. It must be emphasised, however, that the selection of cases should be most carefully made, and here X ray examination is, we hold, indispensable.

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[1] THE LANCET, 1922, ii., 256.

Annotations.

"Ne quid nimis."

THE ASSESSMENT OF FŒTAL AGE.

The danger in medico-legal work of making dogmatic statements with regard to the age of a new- or still-born infant is exposed in the course of a critical study by Dr. J. N. Cruickshank and Dr. M. J. Miller[1] of the accuracy of the various accepted methods of estimating the age of the fœtus. The three methods commonly employed are: (1) Measurement of body-length and body-weight, (2) examination of the number and dimensions of the centres of ossification, and (3) estimation of the duration of gestation from the maternal menstrual history. In the series of 470 normal fœtuses examined, no one method or combination of methods of estimating fœtal age was found to be accurate in all cases, and the conclusion reached was that there can be no absolute certainty that the age of any individual fœtus has been correctly assessed. Attention is especially drawn to the extreme difficulty of estimating fœtal age during the eighth and ninth month. On the whole, body-length has been found more reliable than body-weight; this is of interest in view of the results of recent studies of postnatal development, in which the body-length has been found to be more reliable than body-weight as a guide to the progress of growth. The authors note that in the last three months of intra-uterine life the weight of the fœtus increases at a proportionately greater rate than that of any of the organs studied, except the spleen and thymus. It is during these months that most of the fat is laid on, and they suggest that this may explain the greater proportionate increase of the body-weight. They are cautious, however, in pointing out the limitations of the application of the results obtained from what they regard as too small a number of cases to allow more than tentative conclusions. It is curious that such a detailed and careful study of the normal fœtus has yielded so few positive results; the problem will probably have to be attacked from many different angles. We published last week an attempt on the part of Dr. Lucas Keene and Miss E. E. Hewer, D.Sc., to ascertain by combined chemical and histological methods the period at which the various organs begin to function in the fœtus. The work is suggestive, and may lead in the future to a further means of assessing the age of any individual fœtus.

DEVELOPMENT OF THE IRIS.

We are all well acquainted with the outward appearance of the iris, for we see many scores of examples of its variations every day, but few who are not in the ranks of anatomists or embryologists know much about its intrinsic structure, or are deeply informed concerning its development. Among the numerous papers read at the summer meeting of the Anatomical Society, held at Sheffield on June 27th and 28th, was an interesting communication from Miss I. C. Mann, dealing with some points in the development of the human iris. There are several things in the normal course of formation of this structure which seem to call for future research. The strange provision of a mesodermal stratum, for example, along the inner aspect of which the ectodermal structures extend secondarily, may require investigation into the early stages of evolution of the eyeball to explain its presence and meaning. The pupillary membrane is merely the attenuated central portion of this stratum, and it is to be expected theoretically that a structure that disappears so late as this membrane would leave frequent traces of its former presence. It is probable that such traces are more common than is generally supposed. Certain observations with recent and greatly improved methods of illumination and examination do, in fact, suggest that this is so. The curious and interesting formation of muscle in the iris by direct growth from the margin of the advancing ectodermal or retinal layers was well seen in some of the older sections shown. This origin, which has been known for a number of years, is without parallel in the body, for such ectodermal development as that of the muscles of the hair bulbs, if it actually takes place, is hardly comparable with what is really direct formation from a part of the brain itself. Miss Mann concerns herself with the development of the eye with a view to the explanation of congenital defects of the organ, but it is to be hoped, for the sake of definite knowledge on human formation, that she will continue these observations and researches into the minutiæ of structure and development.

HERPANGINA.

Under the name of "herpangina," Dr. John Zahorsky,[1] of St. Louis, describes a specific febrile disease characterised by the appearance of minute papules, vesicles, and ulcers in the throat. The disease occurs only in the summer months and affects children mainly between the ages of 3 and 10, though a few examples were seen in children between 12 and 15. The epidemic nature of the disease is shown by the affection occurring in groups. In family practice one child after another contracts the sore-throat. On bacteriological examination the same organisms are found as those which are usually present in ordinary sore-throat. The incubation period is from four to ten days. The disease begins with a sudden rise of temperature to 102°–105° F. Vomiting is very common, but not persistent. Headache and pains in the back of the neck are frequent. Nothing is seen on physical examination except the following characteristic appearances of the throat. There are minute vesicles from the size of a millet seed to that of a small pea on the anterior pillars or along the free margin of the soft palate, occasionally on the posterior part of the buccal mucosa or roof of the mouth, but much more frequently on the tonsils or pharyngeal mucous membrane. The vesicles rupture and leave punched-out ulcers, which become covered with a thin exudate. The lesions are never very numerous. In most cases the tonsils present a considerable inflammatory reaction. There is a slight leucocytosis. An irregular fever continues for two to four days, and then the temperature falls by lysis and the other symptoms subside. There are no complications or sequelæ.

THE RESCUE OF DRUG ADDICTS.

We have just received a report of the Homes for Inebriates Association, together with the fortieth annual report of Dalrymple House, Rickmansworth. This house, licensed under the Inebriates Acts, 1879–99, was established in 1883 for the treatment of gentlemen suffering from alcoholism or drug-habit and desirous of cure, and is conducted by a committee elected by an association of prominent churchmen, medical men. Members of Parliament, and others interested in the temperance question. The house is not run for profit, any surplus revenue being spent on improvements for the benefit of the patients. During the past year, of the 72 patients admitted, 55 entered as private patients and 17 under the Acts; 67 of these desired treatment on account of alcoholic excess, and five for drug-habit. The average length of residence was about two and a quarter months, or three and a half months under certificate. The resident medical superintendent, Dr. F. S. D. Hogg. remarks on the need of amendment of the Inebriates Acts in order to allow of non-criminal inebriates being compulsorily placed under supervision and treatment. He continues to receive appeals for advice as to the possibility of such control, and has to admit that, apart from financial or domestic pressure, only persuasion is open to those interested in these victims. So long as they commit no offence against the law they are free to degrade and ruin themselves, their families, and dependents; only, as a rule, when resources are exhausted, positions lost, and constitutions ruined, do they consent to place themselves under treatment. Earlier control would, Dr. Hogg feels sure, result, in many cases, in the retention of position and fortune. An appendix to the report gives particulars of a cumulative group of 1645 patients consecutively discharged. The occupation of these, in order of frequency, is set down as none, merchants, medical practitioners, military officers, clerks, manufacturers, farmers (including market gardeners), solicitors and engineers (equal), distillers (including brewers), clerks in holy orders and civil servants (equal), schoolmasters (including tutors), barristers-at-law, stockbrokers, artists and the theatrical profession, journalists—no other occupational group numbering as many as 20. The kind of inebriant used was in a vast preponderance of cases spirits in some form or other, beer alone occurring only 44 times and wine alone 40 times out of the total of 1645. The after-history of the cases shows how well repaid is the time and trouble incurred, for Dr. Hogg is able to note that about 40 per cent. of the 1645 are doing well, and another 6 per cent. are improved. The terms for admission to Dalrymple House are £6 6s. a week for those who remain three months or longer. Somewhat higher fees are charged for shorter periods. For admission under the Acts the report reminds those interested that the patient must sign a request for admission, specifying a period not exceeding two years, in the presence of a stipendiary magistrate, or better (without publicity) before a justice of the peace. Two persons of either sex, relations being eligible, must also sign a statutory declaration before a justice or commissioner for oaths. There is no necessity for the three signatures to be made at the same time or place; one or all can be signed at Rickmansworth, if preferred. The report, of which we have summarised the main features, is a document of great human interest, based upon clinical material observed and recorded now over a long period of years. We hope that the time is coming when the Association will issue a considered statement of the methods and results of treatment of drug-addiction at Rickmansworth.

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[1] Child Life Investigations. The Estimation of Fœtal Age, the Weight and Length of Normal Fœtus, and the Weight of Fœtal Organs. Medical Research Council. Special Report Series No. 86. H.M. Stationery Office. 1924. 2s. 6d.

[1] Archives of Pediatrics, March, 1924.

POST-GRADUATE WORK ON ALPINE CLIMATE.

THE Davos Medical Association announces a post-graduate course for medical men on tuberculosis and the alpine climate, to be held at the Davos Research Institute during the week August 17th–24th. The course, which is the second of its kind, will be given in both French and German, a detailed prospectus to be issued later. It is now a little over six months since the formal opening of the Institute in the presence of a number of distinguished climatologists, Prof. Loewy being in charge of the physiological department and Prof. Dorno in charge of the meteorological. A number of interesting studies have already originated from the Institute, including work on the volume of the blood at high altitudes, the cholesterin-content of the blood in tuberculous patients, and the mechanism of blood regeneration. A paper appeared recently[1] by Privatdozent P. György, of Heidelberg, on the acid-base balance at high altitudes. Dr. György comes to the conclusion that in patients at rest in Davos there is a lowering of acid excretion in the urine, that climbing gives rise to a perceptible, but not unduly high, increase in the acid-ions eliminated, and that respiratory tetany is more easily induced in the same individual at a height than in the lowland. It is Prof. Loewy's hope that this research institute, the first of its kind in the mountains, may prove of definite value to the practitioner. The question what factors in the alpine climate are responsible for its effects remains still unanswered, as well as the cognate question whether the effect of insolation is to be explained on a chemical or on a physical basis. A library has already been collected at the Institute and is in process of cataloguing and classification, and it is hoped that the third department of the Institute—namely, the bacteriological-pathological—may soon be opened. The Institute is happy in having obtained the reversion of the scientific apparatus no longer required at the observation station of Muottas-Muraigl, above Pontresina. Among those attending the course there may well be some who will be glad to avail themselves of the opportunity for research along new and fruitful channels.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.

THE Medical Women's International Association opened its third Conference in London last week under the presidency of Dr. Esther Lovejoy, of New York. Some 300 members registered their names for these meetings, including 75 representatives of countries overseas; among these were medical women practising in such diverse parts of the world as Constantinople, Uruguay, Australia, and Norway. The time of the delegates, representing some 10,000 medical women, was largely occupied with business, as this was the first meeting of the fully constituted representative council under the amended constitution. After a preliminary meeting held in New York in 1919, at which it was decided to form a world-wide association of medical women, the constitution was discussed and passed at the second meeting held in Geneva in 1922. At the present meeting the necessary by-laws have been added. The general meeting of the Association was held on Wednesday morning, when after the President-elect, Lady Barrett, had been inducted to the chair, representatives from 15 of the 17 countries sending delegates to the meeting told of the numbers, organisation, and work of the medical women in their respective lands. The speakers were: Dr. Grieg (Australia), Dr. Becher-Reidenhof (Austria), Dr. R. Leacock (Canada), Dr. Dewetterova (Czecho-Slovakia), Dr. Thuillier-Landry (France), Dr. Heusler Edenhuizen (Germany), Dr. M. Balfour, C.B.E. (India), Dr. Signe Swensson (Norway), Dr. Grace Stevenson (New Zealand), Dr. A. Ilnicka (Poland), Dr. V. Lebedeva (Russia), Dr. Marie Ugon (Uruguay, South America), Dr. Marie Feyler (Switzerland), Dr. Safieh Ali (Turkey), and Dr. Katherine Manion (U.S.A.). It was announced that Dr. Jane Walker had been appointed treasurer to the Association. On July 17th a discussion took place on maternal morbidity, which is reported on p. 185. The Hospitality Committee, under the presidency of Dr. Jane Walker and its hon. secretary, Dr. Kathleen Lander, had arranged an attractive programme of entertainments and expeditions for members of the Congress. The proceedings opened with a reception and conversazione at the Royal Society of Medicine on July 14th. On the 15th Miss Aldrich-Blake entertained a large party to luncheon at the London (R.F.H.) School of Medicine for Women. In the afternoon of the same day the members were welcomed by the Archbishop of Canterbury and Mrs. Davidson at Lambeth Palace, and in the evening receptions were held by Lady Sybil Smith and by Lady Barrett. On Wednesday a luncheon party, given by the London Association of the Medical Women's Federation at the Botanical Gardens, was followed by a visit to the Royal Free Hospital, and in the evening a large gathering assembled at 10, Downing-street, where the Prime Minister and Miss Ishbel MacDonald welcomed the visitors on behalf of the Government. On Thursday the various provincial associations entertained the foreign guests to luncheon, some of the delegates from the dominions were present at THE LANCET luncheon to doctors from overseas dominions, and in the afternoon parties were invited to tea on the terrace of the House of Commons. In the evening the British Medical Women's Federation held its annual dinner at the Trocadero Restaurant, Piccadilly, for the success of which the admirable arrangements made by Lady Briscoe, M.B., were largely responsible. All overseas delegates were invited as guests and over 320 members and guests were present. The toast of "The Medical Women's International Association" was proposed by Prof. Graham Wallas and Mrs. Scharlieb, M.D., and responded to by Dr. Esther Lovejoy and Mme. Thuillier-Landry. "The Guests" was proposed by Dr. Jane Walker and replied to by Mrs. Fawcett, who was received with musical honours, and by Dr. Thelberg (U.S.A.). The proceedings concluded with "The Health of the Chairman," Lady Barrett, proposed by Dr. Walter Carr. On Friday morning the British members held their annual meeting, while a party of foreign delegates were shown over the museum of the Royal College of Surgeons of England by Sir Arthur Keith. Visits were paid to the Barbers' Hall and to the Apothecaries' Hall, and opportunity was provided for the foreign delegates to see the clinical work in various general and special hospitals and clinics. On July 19th a party of delegates was entertained at Bath, on the 20th at the East Anglian Sanatorium at Nayland, and on the 21st at Brighton.

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[1] Schweizerische Medizinische Wochenschrift, 1924, p. 416.

RUPTURE OF THE SPLEEN FROM THERAPEUTIC MALARIA.

THERE is one aspect of the treatment of general paralysis of the insane by the artificial induction of malaria which has not yet received the attention it deserves. The subjects of general paralysis are often debilitated, feeble creatures, incapable of withstanding diseases which even the young and robust find most exhausting. In many countries in which malaria is endemic and syphilis is common, general paralysis is comparatively rare, and our knowledge of the action of one disease on the other is, therefore, very incomplete. We shall soon know more of this interaction, after more cases of general paralysis have been treated by the artificial induction of malaria. Together with encouraging results, a few disquieting accounts have been published of the effects of tertian malaria on the subjects of general paralysis. In *Le Scalpel* for May 10th Dr. M. Alexander records the case of a man, aged 50, admitted to hospital on Feb. 8th, 1924, suffering from general paralysis. For several months there had been progressive mental deterioration, with great irritability and incoherency. He looked much older than he was, he was easily fatigued, the tendon reflexes were exaggerated, and the skin reflexes diminished. The examination of the cerebro-spinal fluid confirmed the clinical diagnosis, and on April 9th he was given a subcutaneous injection of 5 c.cm. of blood from a patient suffering from tertian malaria. Ten days later a bout of fever developed, but it did not conform to type, a rise of temperature occurring every second day. The patient underwent with apparent impunity and ease eight attacks of fever, the temperature reaching 39° C. After the eighth attack he was seen to turn pale and to collapse on his bed, where he was found to be dead. The necropsy confirmed the diagnosis of general paralysis without, however, revealing any lesion of the brain. The kidneys were intact, whereas there was some cardio-arterial sclerosis. The abdominal cavity was full of blood derived from a soft spleen which had ruptured, the appearance of the spleen suggesting a veritable explosion within it. As long as such an incident is isolated it need not be regarded as more than a clinical curiosity. General paralysis of the insane is such a terrible disease that it is justifiable to take even great risks in the attempt to check its progress, but if the incident just described recurs frequently, it is conceivable that treatment with malaria may have to be confined to those cases of general paralysis in which there is a fair margin of general vitality and recuperative power. In Denmark advanced cases of general paralysis have been used as human thermostats in order to keep a strain of tertian malaria alive by frequent passage, and it will be interesting to learn what effect the malaria has had on these incurable cases.

MEDICAL STUDIES IN VIENNA.

ADVANCED English medical students have indicated a wish recently to continue their medical studies in the Medical Faculty of Vienna, and that faculty has now decided to allow such students to enter their schools, and further, will recognise in the case of the unqualified men the studies already attended in English medical schools. Similarly, there will be recognition of the examinations passed in England which correspond to the Austrian First Professional Examination—namely, physics, biology, chemistry, anatomy, histology, and physiology—but exemption will not be granted from the first Austrian examination unless a candidate has passed in all of these subjects in England, as they constitute one examination in Austria.

DECOMPOSITION OF URINE AND ITS PREVENTION.

IT is often desirable to collect the urine that is passed during the 24 hours in order that the analysis of such an abnormal constituent as sugar may give correct information as to the total daily output of sugar. To trust to a random sample of urine passed at any hour of the day is to court gross inaccuracy. But the collection of all the urine passed in the 24 hours does not get over this difficulty unless its decomposition is prevented by some means or other, for ammoniacal decomposition and changes in the sugar content of the urine are apt to stultify the results of an analysis. In a paper in *Norsk Magazin for Lægevidenskaben* for June, Dr. T. Brandt and Dr. R. C. Stokstad have published investigations throwing light on this problem and providing a simple solution to it. They have tested a variety of disinfectants and have found that many of the most common, such as formalin and carbolic acid, are unsuitable because of their capacity to reduce sugar. They have found toluol act satisfactorily, but not for longer than 24 hours. The same could be said of thymol. Xylol proved to be an unsatisfactory disinfectant, and so did chloroform, probably because it was too volatile for the purpose. Perchloride of mercury in a strength of 0·5 per 1000 prevented decomposition even for 48 hours, and toluol prevented decomposition for 24 hours, when 15 c.cm. were added to a litre and a half of urine and thoroughly shaken. The same effect could be obtained with 15 c.cm. of a 10 per cent. solution of thymol in alcohol. But most of these disinfectants possess certain disqualifications. Either they are too expensive for routine hospital work or they are (with the exception of perchloride of mercury) inadequately soluble in the urine, which has to be shaken vigorously to obtain the desired result. Another objection to toluol is its inflammable properties, and the greasy coating it leaves on the test-tube. In view of all this, the authors have abandoned the idea of preventing decomposition of urine with the help of disinfectants, and they have done so the more willingly as they have come to the conclusion that the problem is one of chemistry and physics as well as of bacteriology. For, as they point out, the rate of decomposition of various urines is far from uniform, even when the bacterial contamination is uniform. Their investigations have shown that the best solution to this problem is to be found in a study of the hydrogen-ion concentration 'of the urine, a sample with a pH under 5·0 showing practically no ammoniacal decomposition even after 24 hours in a thermostat. All that is therefore needed to prevent decomposition of urine is to render it highly acid, and for this purpose the authors recommend the addition of about 15 c.cm. of HCl to every litre and a half of urine. Any other acid will serve the same purpose except nitric acid, which destroys various organic substances.

PSYCHOLOGICAL TESTS OF EDUCABLE CAPACITY.

THE report[1] of the Consultative Committee of the Board of Education on psychological tests of educable capacity and their possible use in the public system of education has just been issued. After an historical sketch of the development of the psychological tests, and a discussion on the merits and disadvantages of the various types of tests and their scope, the Committee proceeded to consider "intelligence" tests in connexion with ordinary examinations intended primarily to test ability. The possibility of such tests in schools of different types and of standardised scholastic, vocational, and physical tests, and tests of memory, perception, and so forth, affording subsidiary information is also considered. The provision of courses for teachers in experimental psychology and the question of taking steps to coördinate and organise research and to distribute information bearing on the application of psychological and statistical methods to education are also discussed. In summarising the conclusions arrived at, the Committee note a general agreement that tests of "intelligence" are of value as supplements to, but not as substitutes for, the present methods of estimating individual capacity. Group tests are recommended for children over 10 and for adults as easier to apply, mark, and interpret by teachers with but little psychological training; individual tests, which are more suitable for young children, require application by an expert. All tests need considerable discretion in their interpretation. As to the bearing of psychological tests on public examinations, it is regarded as probable that in time the whole theory and technique of ordinary examinations will be modified by the application of the principles adopted in constructing and standardising intelligence and scholastic tests. The need for study of the legitimate aims and inevitable limitations of viva voce examinations and their technique is brought to the attention of psychologists. In view of the desirability of coördinating research, it is suggested that the Board of Education, either acting independently or in association with other Government departments interested in psychological tests, should set up an advisory committee to work in union with university departments of psychology and other organisations.

THE house and library of the Royal Society of Medicine will be closed during the whole of August for cleaning and repairs.

MR. DAVID P. D. WILKIE, F.R.C.S., has been appointed by the Curators of the University of Edinburgh to the Chair of Surgery, which has been vacant since the retirement of the late Prof. Alexis Thomson last October. The appointment is for a definite period of ten years from next October. Mr. Wilkie is at present assistant surgeon in the Edinburgh Royal Infirmary, and is lecturer on clinical surgery in the University of Edinburgh.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXI.—ACUTE ANTERIOR POLIOMYELITIS.

IN the treatment of a disease an accurate conception of its pathology is an essential. The pathology of acute anterior poliomyelitis divides itself, when looked at from a therapeutic standpoint, into three stages. These may be labelled for convenience the stage of onset, the stage of destruction, and the stage of repair.

Stage of Onset.

The stage of onset is not always evident. When it occurs its symptoms are often vague. Fever, malaise, sore-throat, perhaps some slight gastro-intestinal disturbance are all accompaniments of the onset of many other commoner diseases. Not until the second stage, that accompanied by the development of a sudden paralysis, does the enemy reveal himself, and then at a time when his damage is already half done. But it is in the first stage of the illness that treatment may be really effective and when diagnosis should ideally be made; *in the presence of an epidemic* there are two phenomena that may lead to a correct diagnosis before the onset of paralysis. Pain in the limbs and spine, sometimes in the former case so severe as to suggest acute rheumatism, may precede the paralysis by 24 hours. A lymphocytosis in the cerebro-spinal fluid is found almost invariably during the first stage. Two therapeutic measures are of value at this period, serum given intrathecally and intravenously and large doses of urotropin administered by the mouth.

Serum Treatment.—The serum should be that of patients some weeks convalescent from the disease, but as the immunity conferred by attacks of filter-passing organisms is both great and prolonged it is probably that serum is still of protective value up to a period of five years. The blood (200 c.cm.) should be collected in a flask previously rinsed out with sterile normal saline solution. After the clot has separated firmly the serum (about 100 c.cm.) is drawn off and kept in a cool place. It is administered both intrathecally and intravenously on two successive days, about 25 c.cm. being given by both routes on each day. Malaria and syphilis must, of course, be excluded in the donor. S. Flexner and P. A. Lewis showed that, whereas intracerebral inoculation of the virus into monkeys invariably produced the disease, yet if human serum derived from convalescent children were given to the animals intrathecally paralysis in some cases was delayed and in others completely prevented. In the case of an epidemic such convalescent serum may well be procurable, but otherwise horse serum can be given. There is some evidence that this also contains antibodies against the virus. Whichever is used the administration is of greatest value in the first or pre-paralytic stage, but *is probably still of some value for the first two or three days after paralysis has appeared.* If horse serum is used it may be necessary to desensitise the child against the occurrence of anaphylaxis by successive half-hourly doses of ♏i., ½ c.cm., 5 c.cm., before giving the full intravenous and intrathecal doses.

Urotropin.—As for convalescent serum, so for urotropin, there is experimental evidence of its probable value in acute poliomyelitis. S. Flexner and Clark have shown that if large doses of the drug are administered to monkeys an appreciable amount is soon to be detected in the cerebro-spinal fluid; and, furthermore, that if the monkeys are during this time inoculated with the virus of acute poliomyelitis paralysis can be delayed and even in some cases prevented. There is no doubt that to obtain a therapeutic effect large doses should be given.

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[1] H.M. Stationery Office. 1924. 2s.

the drug being pushed boldly for a short period. G. F. Still quotes the case of a child, 21 months old, to whom 10 gr. were given every two hours for 24 doses. These heavy doses are the more allowable in that the period during which active damage to the central nervous system occurs is a short one, and it is during that time, amounting to three or four days in all, that the action of the urotropin in the theca is desired. The organ most likely to be damaged in any way by the urotropin is the kidney, and careful daily urinary examinations for albumin and blood should be made as a routine. Urotropin may also wisely be given for a week to children who have come into contact with cases of the disease as a prophylactic measure.

Stage of Destruction.

This stage lasts probably for five or six days. During that time the damage to the nerve tissues is done. This damage is to be divided into two categories, permanent and temporary. Some of the anterior horn cells are so severely hit that recovery can never occur, others are only partially poisoned or mechanically interfered with by their proximity to the areas of attack and the resulting local inflammatory changes. Furthermore, it must be remembered that hyperæmia is found post mortem in parts of the central nervous system far from the paralysed areas. It is with a view to resting these insulted rather than wounded tissues that treatment is designed at this period. The patient is kept at rest in a quiet, airy room, bright light is excluded, and visitors are not allowed for the first week. Bromides and even chloral can reasonably be given to shield the nervous system from all excessive stimuli. As mentioned above, serum and urotropin should be given for the first 48 hours of paralysis.

Stage of Repair.

The stage of repair may last for two years, and it thus comprises the large majority of cases of infantile paralysis met with in practice. Its successful treatment is a lengthy, often a tedious, business. But this conception—one of almost invisibly slow but steady progress—is one to be held by the medical attendant and to be explained carefully to the parents of the patient. Treatment of the disease is thus a campaign rather than a battle, and for its success considerable attention to detail is necessary. Since the essential pathological lesion involves the anterior horn cells it is obvious that the peripheral manifestations will be motor and trophic. The trophic lesion results in peripheral vasodilation and loss of heat, and must be compensated for, in the case of the legs, by the wearing of long woollen stockings. If these are insufficient further coverings, possibly quilted, must be made and worn: paralysed arms are similarly treated.

It is, however, the damage to the motor mechanism that demands the greatest assiduity and care in treatment. The treatment consists of (*a*) immobilisation, (*b*) massage, (*c*) passive and active movements, (*d*) repair operations. As soon as the diagnosis is sure an exact investigation must be made as to which muscles are paralysed. This can be done by stimulating their movements and by carefully watching, or more accurately by noting their electrical reactions. The limb should then be immobilised without delay in such a position that the paralysed muscles are relaxed and their antagonists slightly on stretch. There is nothing so fatal to the complete recovery of a paralysed muscle as tension. On the other hand, tension of the sound muscles causes a reflex relaxation on the part of the antagonistic unsound muscles. The exact form of immobilisation does not greatly matter, but two points should be kept in mind; the support should be light and should be easily removable to permit of daily massage. The best material is celluloid.

Massage.—The most valuable ally in the campaign waged for the recovery of the limb from paralysis is the mother. She should understand that the task will last for two years, and she should, if a trained nurse is not permanently available, be taught to massage her child. During the first month or two she should watch the process and should learn how to carry it out herself. Ultimately there is no reason why she should not shoulder the whole burden herself. The instructions given her should be specific. Those in use at the Hospital for Sick Children, Great Ormond-street, are comprehensive and valuable; they are as follows:—

Rubbing.—This must be done for a quarter of an hour twice a day. Lay the child on a bed.

1. Rub the paralysed leg from the foot right up to the top of the thigh. Rub upwards only. Put the broad part of your hand on the back of the child's leg. In rubbing the thigh put your hand first on the back of the thigh and afterwards on the front, but always rub upwards and be sure to go as high as the loins. Whilst rubbing with your right hand hold the foot with your left. Use for rubbing any kind of oil.
2. Take hold of the child's leg with your two hands just above the ankle. Rub round the leg with your two hands in opposite directions, as though you were wringing out sheets. Work up the leg and thigh from the foot up to the top of the thigh in the above manner.
3. Take the child's calf with your two hands. Put your fingers to the back part of the leg and your thumbs to the front. Squeeze the soft parts out between your finger and thumbs so as to flatten the leg out and make it as wide as possible. Work right up the leg and thigh in this manner.
4. Put your right hand over the front of the knee and your left under the foot. Push up the foot and, holding your right hand in front of the knee, you will prevent yourself doing any harm. You want, if possible, by pushing the foot to make the child push against your left hand with all its might. This is the most important of all exercises.
5. Flip every part of the leg and thigh with your fingers so as to make the whole of the limb quite red and warm.
6. Gently rub up and down all over. This will take away the stinging which was left by the last movement.

Passive Movements.—At the end of the day's massage the joints of the affected limb should be moved passively in all their normal directions, especially in the direction towards which they would be drawn by the paralysed muscles.

Active Movements.—The child should be encouraged to try to move the paralysed limb and the slightest twitch of an affected muscle should be drawn attention to and praised. It will sometimes be found that such movements will first be noticed in a warm bath, and this fact should be remembered and impressed upon the mother.

Repair Operations.—The advances made in orthopædic surgery make it probable in the majority of cases that further functional improvement can be obtained after all active repair has ceased, either by tendon transplantation or by joint fixation or by some other mechanical shift. Since, however, repair may progress for two years it is wise to postpone operative treatment until it is certain to what extent such a measure is necessary.

GEOFFREY BOURNE, M.D., M.R.C.P. Lond.,
Chief Assistant, St. Bartholomew's Hospital; Physician,
East London Hospital for Children, Shadwell.

QUEEN ALEXANDRA SANATORIUM FUND.—The annual report for 1923–24 shows that 28 grants were made to 14 men and 14 women, who were thus enabled to take a prolonged cure in the Alps during the past winter season. The average stay amounted to 158 days, and the winter was a fine one, offering the best possible conditions for successful treatment. The average cost to the Fund of each patient has been about £15 10*s.*, or at the rate of 6*s.* 8½*d.* per day, the total cost per patient per day for maintenance and treatment being approximately Fr.16. The patients have, therefore, paid just under 50 per cent. of the cost of their treatment. Of immediate results, 22 gained in weight, in 9 the disease was arrested, and 7 others were improved; 3 cases were treated with tuberculin injections, 2 with vaccine injections, and 4 with antiseptic inhalations. It has been decided to make a limited number of grants during the present summer. The sanatorium at Davos was only reopened on Oct. 15th, 1923, but experience is already sufficient to show an extensive demand for a scheme of assistance on the lines of the Fund.

Special Articles.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION.

MATERNAL MORBIDITY: ITS CAUSES AND PREVENTION.

AT the scientific session of this Association, held on July 17th, the Chairman, Lady Barrett, President of the Association and of the British Medical Women's Federation, in an opening paper, pointed out that the causes of maternal morbidity are, in effect, the same as those that account for our maternal mortality—viz., sepsis, hæmorrhages, toxæmias of pregnancy, difficulties in labour, and complicating diseases, such as heart disease. The general health of the woman protects her to a very large extent against almost all these dangers; it guards her from the toxæmias, affects the activity of the uterus in labour, contributes to the endurance of the patient in the event of long or difficult labour, and provides the necessary resistance to the invasion of organisms.

The Problem as one of General Health.

The problem of maternal morbidity was, therefore, the problem of the woman who is not in perfect health, and the line of attack must be that of general health and conditions of living. All working for the improvement of motherhood—doctors, nurses, midwives, health visitors, and administrators—were, said the speaker, engaged primarily in the process of observation, noting when and where and how the health of the expectant mother deviates from the line of normality, and in this respect the doctors, nurses, and administrators were dependent to a very large extent on the health visitor, who has greater leisure for such observations. In theory we knew enough to reduce the present maternal mortality and its dependent maternal morbidity by one half, as had, indeed, been done in certain areas of the country. Our task was to see that this knowledge was put into practice in every county and district of the land.

Dame Janet Campbell gave an account of the methods and mechanism employed by the Ministry of Health and local authorities in this country for the assistance of mothers and infants. She pointed out that, while the infant mortality-rate had been very considerably reduced during the last 20 years, the maternal mortality-rate (1 in 250) had remained almost unaltered, although the introduction of the Midwives Act seemed to have reduced the puerperal sepsis rate to some extent.

Dr. Margaret Balfour, representing India, told the Conference of the conditions there. The local midwives, though ignorant of modern methods of asepsis, were capable of dealing with ordinary cases, though their ineradicable habit of unnecessary interference rendered them a source of danger; but in all abnormal cases the rate of mortality reached an enormously high figure. In Bengal, where the majority of the primiparæ were under 13 years of age, over 16,000 girls died in childbirth in 1921. In the Punjab a medical woman had recently been appointed to assist the Director of Public Health, but very much more in this direction yet remained to be done.

Value of Lactation.—Importance of Diet.

Dr. Helen Boyle (Brighton) spoke of the nervous and mental aspects of the subject and stressed the extreme rarity of puerperal insanity in mothers who nursed their babies. There was far too great a tendency to take the baby off the breast at the slightest sign of nervous symptoms, and to overlook the fact that lactation is not only a secretion for the benefit of the infant, but also an excretion for the benefit of the mother. She concluded with a plea for the observation and early treatment in every case of early nervous developments after childbirth.

Dr. Effa Davis (Chicago) said that as a result of her 30 years' experience of maternity work in the United States, she had come to the conclusion that much might be done to improve the conditions of labour in healthy women. For instance, there was the type that ate too much and exercised too little; they had too big children. By careful regulation of the regimen of the pregnancy period it was always possible to reduce the size of the child and thus reduce the difficulties of parturition. Dr. Davis spoke with admiration of the School of Domestic Science at King's College for Women, Campden Hill, and hoped for the wide extension of such work until every woman was taught, from childhood upwards, how to look after herself and her home in the best possible way. Two practical prophylactic points which Dr. Davis had found useful against sepsis were the employment of oakum instead of cotton for pads, thus introducing a mildly antiseptic atmosphere; and the custom of allowing all normal cases to rise from bed for the evacuation of the bladder and bowel, thus allowing the force of gravity to play its part in the drainage of the uterus.

The Blood Pressure Factor in Eclampsia.

Frau Dr. Heusler Edenhuizen (Berlin) spoke of some investigations bearing on the prophylaxis of eclampsia. It was found in Germany during the years 1918–20, when there was an average loss in weight among women of 17 kilos each, that there was a striking decrease in the incidence of eclampsia, although all parturient women were in a state of very great exhaustion. These women were found to have a blood pressure as low as 116 mm. and this appeared to be the significant factor. Dr. Edenhuizen had found that of all methods tried for reducing the blood pressure twilight sleep was the most valuable, reducing the pressure sometimes from 180 mm. to 130 mm. in two hours. She went on to speak of puerperal sepsis, and stated that she had found, without exception, that where sepsis occurred, in spite of the most rigid antiseptic measures, there had been coitus within a few weeks of labour. Among the peasants of the Rhine valley there was a superstition that coitus during the first pains renders labour easier: sepsis was there very prevalent and no antiseptic measures seemed able to counteract it. Among the educated classes of Berlin Dr. Edenhuizen had been able greatly to reduce the incidence of sepsis by forbidding intercourse after the fifth month.

Dr. Sylvia Chapman (New Zealand) told of the "Safe Maternity Campaign" which had recently taken place there. In the last five years 755 lives had been lost through puerperal deaths among a population of 1,000,000, and this was attributed to two causes—viz., the lack of proper antenatal supervision and the existence of private maternity hospitals run by midwives not fully competent for the work. A few antenatal clinics had recently been started in connexion with the St. Helen's Hospitals (the Government maternity hospitals), but they were as yet poorly attended, and there is need of education among women as to the importance of the antenatal period.

Frequency of Gonococcal Infections.

Miss Frances Ivens (Liverpool) emphasised the great importance of antenatal care, and the significance of the gonococcus, often latent or unrecognised, in the production of puerperal sepsis. She urged a more careful inquiry into the history of the patient, both maternal and general, and into the nature of any discharge; and made a plea for more and better equipped maternity beds, and better teaching of medical students in this subject.

Dr. Alina Ilnicka (Warsaw) read a paper on the morbidity amongst working mothers, which was greater than that amongst women who do not work at any trade or profession, showing that there must be something wrong in the woman worker's way of living. Such occupations as sewing machine pedalling, ironing, factory work requiring continuous treadling the drug being pushed boldly for a short period. G. F. Still quotes the case of a child, 21 months old, to whom 10 gr. were given every two hours for 24 doses. These heavy doses are the more allowable in that the period during which active damage to the central nervous system occurs is a short one, and it is during that time, amounting to three or four days in all, that the action of the urotropin in the theca is desired. The organ most likely to be damaged in any way by the urotropin is the kidney, and careful daily urinary examinations for albumin and blood should be made as a routine. Urotropin may also wisely be given for a week to children who have come into contact with cases of the disease as a prophylactic measure.

Stage of Destruction.

This stage lasts probably for five or six days. During that time the damage to the nerve tissues is done. This damage is to be divided into two categories, permanent and temporary. Some of the anterior horn cells are so severely hit that recovery can never occur, others are only partially poisoned or mechanically interfered with by their proximity to the areas of attack and the resulting local inflammatory changes. Furthermore, it must be remembered that hyperæmia is found post mortem in parts of the central nervous system far from the paralysed areas. It is with a view to resting these insulted rather than wounded tissues that treatment is designed at this period. The patient is kept at rest in a quiet, airy room, bright light is excluded, and visitors are not allowed for the first week. Bromides and even chloral can reasonably be given to shield the nervous system from all excessive stimuli. As mentioned above, serum and urotropin should be given for the first 48 hours of paralysis.

Stage of Repair.

The stage of repair may last for two years, and it thus comprises the large majority of cases of infantile paralysis met with in practice. Its successful treatment is a lengthy, often a tedious, business. But this conception—one of almost invisibly slow but steady progress—is one to be held by the medical attendant and to be explained carefully to the parents of the patient. Treatment of the disease is thus a campaign rather than a battle, and for its success considerable attention to detail is necessary. Since the essential pathological lesion involves the anterior horn cells it is obvious that the peripheral manifestations will be motor and trophic. The trophic lesion results in peripheral vasodilation and loss of heat, and must be compensated for, in the case of the legs, by the wearing of long woollen stockings. If these are insufficient further coverings, possibly quilted, must be made and worn; paralysed arms are similarly treated.

It is, however, the damage to the motor mechanism that demands the greatest assiduity and care in treatment. The treatment consists of (*a*) immobilisation, (*b*) massage, (*c*) passive and active movements, (*d*) repair operations. As soon as the diagnosis is sure an exact investigation must be made as to which muscles are paralysed. This can be done by stimulating their movements and by carefully watching, or more accurately by noting their electrical reactions. The limb should then be immobilised without delay in such a position that the paralysed muscles are relaxed and their antagonists slightly on stretch. There is nothing so fatal to the complete recovery of a paralysed muscle as tension. On the other hand, tension of the sound muscles causes a reflex relaxation on the part of the antagonistic unsound muscles. The exact form of immobilisation does not greatly matter, but two points should be kept in mind; the support should be light and should be easily removable to permit of daily massage. The best material is celluloid.

Massage.—The most valuable ally in the campaign waged for the recovery of the limb from paralysis is the mother. She should understand that the task will last for two years, and she should, if a trained nurse is not permanently available, be taught to massage her child. During the first month or two she should watch the process and should learn how to carry it out herself. Ultimately there is no reason why she should not shoulder the whole burden herself. The instructions given her should be specific. Those in use at the Hospital for Sick Children, Great Ormond-street, are comprehensive and valuable; they are as follows:—

Rubbing.—This must be done for a quarter of an hour twice a day. Lay the child on a bed.

1. Rub the paralysed leg from the foot right up to the top of the thigh. Rub upwards only. Put the broad part of your hand on the back of the child's leg. In rubbing the thigh put your hand first on the back of the thigh and afterwards on the front, but always rub upwards and be sure to go as high as the loins. Whilst rubbing with your right hand hold the foot with your left. Use for rubbing any kind of oil.
2. Take hold of the child's leg with your two hands just above the ankle. Rub round the leg with your two hands in opposite directions, as though you were wringing out sheets. Work up the leg and thigh from the foot up to the top of the thigh in the above manner.
3. Take the child's calf with your two hands. Put your fingers to the back part of the leg and your thumbs to the front. Squeeze the soft parts out between your finger and thumbs so as to flatten the leg out and make it as wide as possible. Work right up the leg and thigh in this manner.
4. Put your right hand over the front of the knee and your left under the foot. Push up the foot and, holding your right hand in front of the knee, you will prevent yourself doing any harm. You want, if possible, by pushing the foot to make the child push against your left hand with all its might. This is the most important of all exercises.
5. Flip every part of the leg and thigh with your fingers so as to make the whole of the limb quite red and warm.
6. Gently rub up and down all over. This will take away the stinging which was left by the last movement.

Passive Movements.—At the end of the day's massage the joints of the affected limb should be moved passively in all their normal directions, especially in the direction towards which they would be drawn by the paralysed muscles.

Active Movements.—The child should be encouraged to try to move the paralysed limb and the slightest twitch of an affected muscle should be drawn attention to and praised. It will sometimes be found that such movements will first be noticed in a warm bath, and this fact should be remembered and impressed upon the mother.

Repair Operations.—The advances made in orthopædic surgery make it probable in the majority of cases that further functional improvement can be obtained after all active repair has ceased, either by tendon transplantation or by joint fixation or by some other mechanical shift. Since, however, repair may progress for two years it is wise to postpone operative treatment until it is certain to what extent such a measure is necessary.

Geoffrey Bourne, M.D., M.R.C.P. Lond.,
Chief Assistant, St. Bartholomew's Hospital; Physician,
East London Hospital for Children, Shadwell.

Queen Alexandra Sanatorium Fund.—The annual report for 1923–24 shows that 28 grants were made to 14 men and 14 women, who were thus enabled to take a prolonged cure in the Alps during the past winter season. The average stay amounted to 158 days, and the winter was a fine one, offering the best possible conditions for successful treatment. The average cost to the Fund of each patient has been about £15 10*s.*, or at the rate of 6*s.* 8½*d.* per day, the total cost per patient per day for maintenance and treatment being approximately Fr.16. The patients have, therefore, paid just under 50 per cent. of the cost of their treatment. Of immediate results, 22 gained in weight, in 9 the disease was arrested, and 7 others were improved; 3 cases were treated with tuberculin injections, 2 with vaccine injections, and 4 with antiseptic inhalations. It has been decided to make a limited number of grants during the present summer. The sanatorium at Davos was only reopened on Oct. 15th, 1923, but experience is already sufficient to show an extensive demand for a scheme of assistance on the lines of the Fund.

ought not to be costly. The provision of baths should depend upon the public opinion of the locality. Parlours, too, were rather amenities than essentials, and should only be provided if the occupiers were prepared to pay the extra rent involved. He concluded his address with a note of warning that the pursuit of sanitation and sanitary comforts was not a sufficient aim in itself, and could only be safely practised by a nation which realised that these things, important as they are, are only valuable according as they bring up a race which, governed by the spiritual idea of service, becomes more capable of effort and more equal to the achievement of the work which its world-wide responsibilities demand.

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and other forms of work acting as a vibratory massage of the uterus, left their mark in such disabilities as dysmenorrhœa, difficult healing of pelvic wounds, and a high percentage of abortions. Dr. Ilnicka urged more careful factory inspection, with these points in view, closer cöoperation between doctor, masters, and operatives, and selection among the workers, so that the woman was put in a position to produce the maximum of work with the minimum of fatigue. Not only was the manual worker badly situated, but the professional woman also, who, in Poland at any rate, did her six or eight hours work of teaching, clerking, or what not, and then returned to do all the duties of the home, very few being able to afford a maid. In Poland women were given eight weeks' leave before and six weeks after childbirth, and there was a possibility of the latter being increased to 12 weeks. The infant mortality-rate was 39 per cent. lower in cases where the mother remained away from work three months or more, than in cases where the baby was put on the bottle at the end of a month.

Dr. Becher-Reidenhof (Vienna) spoke of tuberculosis during pregnancy, and stated that the presence of the bacilli was not in itself dangerous, but that serious symptoms, such as high temperature and hæmoptysis, were doubly grave at such a time. The prognosis in the event of induction depended on the degree of infection and the duration of pregnancy, the outlook being most hopeful the earlier the uterus was emptied.

Dr. Kate Mead (Middleton, U.S.A.) spoke of the administrative methods in use in the U.S.A. since the introduction, two years ago, of the Bill allotting to each State a sum of money, to be doubled by the State, for the care of pregnant women. In her town there were nine visiting nurses among the 25,000 inhabitants, and they went to the houses of rich and poor alike, while every woman, no matter what her means might be, expected to go to the State hospital for her delivery. The midwives were not very good, and Dr. Mead urged more careful teaching of nurses in regard to asepsis, and suggested that sterile gloves should be worn for all services such as handling of bed-pans and bed-trays.

Dr. Rosamund Leacock (Canada) dealt with the bacteriological aspect of puerperal sepsis, after outlining the conditions of maternity work in Canada, where there were practically no midwives, only a few women who were allowed to manage cases living more than 30 miles from a doctor. She divided the causes of sepsis into extrinsic and intrinsic. Under the former heading she urged inquiries into any condition of slight sepsis in members of the household, since the streptococcus that is relatively unimportant in the ear or antrum of a relative might be fatal if it found its way into the uterus of the lying-in woman. Under the intrinsic causes she pointed out how a streptococcus could live for years in the Fallopian tubes, and said that no pregnancy should be allowed for at least two years after any pelvic infection.

Maternity Work in Russia.

Dr. V. Lebedeva (Director of the National Department for the Protection of Maternity and Child Welfare in Soviet Russia) presented a paper on the work being done there. She said that first of all her countrymen regard motherhood as a social function and mothers' and infants' welfare as a task of the State, and secondly, that the woman was always regarded as a force in the process of work. Thus the creche occupied a far more important place in Russian maternity work than in other countries. The legally-secured leave-period for Russian mothers was four months for manual workers and three months for intellectual workers. The institutions in force in the large centres include consultation clinics for infants, toddlers, and pregnant women, tuberculosis and venereal disease dispensaries, feeding centres and milk canteens, and offices for legal consultation and educational patronage. Allowances were granted through insurance offices for the time of pregnancy and lactation and for the necessary accouchement outfit. On Jan. 1st, 1924, there were in Russia 548 creches, 185 children's clinics, 44 mothers' clinics, 107 homes for mother and child, 401 homes for children, and 35 maternity homes. In Moscow a scientific institute of mothers' and infants' welfare had been established to deal with the physiology and pathology, prophylaxis and therapeusis of the mother and child, together with the teaching of physicians, pediatrists, midwives, and nurses. Here 197 doctors and 434 nurses and midwives were working.

Dr. Safieh Ali (Constantinople) said that the maternal morbidity in Turkey was chiefly due to sepsis resulting from lack of adequate nourishment during pregnancy and care during the puerperium. The women were well taken care of during labour, and the midwives' school, opened in 1847, was an excellent one. The first maternity hospital was opened in Stamboul in 1892, and there now existed Red Crescent antenatal polyclinics where expectant mothers were examined and supplied with food where necessary.

Mme. J. Réquin (Paris) divided the causes of maternal morbidity into medico-surgical and social, and gave statistics showing the relative proportion of deaths due to the various causes. She described the preventive work done in France, where there are free antenatal clinics in connexion with a hospital, a laboratory, a venereal disease and a tuberculosis dispensary. She urged the need for coöperation between doctor, midwife, and health visitor in educating women as to the importance of antenatal care. For those women who are delivered at home certain institutions provided advice on hygiene and lent materials for the accouchement, but there was need for more maternity hospitals, and for increased facilities of transport in country districts. The social causes of morbidity Mme. Réquin described as fatigue, unhappiness, and prejudice—i.e., against the unmarried mother, and against lack of luxuries and comfort which leads an increasing number of pregnant women to procure abortion.

Dr. Signe Swensson (Norway) spoke of the importance of diet in the pregnant period, and the greater part of her paper was occupied with the question of the vitamin-content in the artificially-prepared foods of the present day.

Papers by Dr. Hamilton, from the International Committee of the Association of Women in Public Health; by Dr. Wanda Szczawinska, of Warsaw; by Dr. Daisy Robinson (U.S.A.) on the public health and venereal disease aspect of the subject; and by Dr. Sarah Buckley, of Chicago, were also communicated.

CONGRESS OF THE ROYAL SANITARY INSTITUTE.

THE thirty-fifth annual Congress of the Royal Sanitary Institute, held last week at Liverpool, was well attended by some 1250 delegates, many of them from overseas. The delegates included representatives of the medical, engineering, and architectural professions, and many members of health authorities in all parts of the kingdom.

The Inaugural Address.

Lord Salisbury, the President of the Congress, delivered an inaugural address to a large audience in St. George's Hall on the evening of July 14th. He showed that the remarkable progress made in public health matters during the 70 years since Disraeli enunciated his famous aphorism "Sanitas sanitatum, omnia Sanitas," gave no justification for pessimism. Nevertheless, much remained to be done. The back of the housing problem was not yet broken. The corporation of Liverpool had done a great deal. They owed much also to the authors of the Garden City movement. The essentials of a healthy house ought not to be costly. The provision of baths should depend upon the public opinion of the locality. Parlours, too, were rather amenities than essentials, and should only be provided if the occupiers were prepared to pay the extra rent involved. He concluded his address with a note of warning that the pursuit of sanitation and sanitary comforts was not a sufficient aim in itself, and could only be safely practised by a nation which realised that these things, important as they are, are only valuable according as they bring up a race which, governed by the spiritual idea of service, becomes more capable of effort and more equal to the achievement of the work which its world-wide responsibilities demand.

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Sir Squire Sprigge, the Editor, who endorsed the Chairman's words of welcome, regretted that duty had prevented the gathering from being larger, so many who had responded to the call of Imperial celebration by presence in the mother country having had to return home; but even in these circumstances the quality of the response to the invitation was significant. As an example of the spread of medical knowledge and increased facilities of inter-communication, he pointed out that in a copy of The Lancet dated a little more than 100 years ago he found the first foreign communication: it was about half a column in length and had taken seven days to travel about 240 miles. Its appearance was considered by the editorial staff of that day to be a great event, for it was referred to at the beginning and in the middle of the paper and again commented upon in the following week. That was foreign correspondence in 1824. And now the publication of foreign correspondence from almost every part of the globe was a weekly incident. Although such effort was common to any newspaper which attempted in the smallest way to mirror the modern interchange of scientific thought, it could not be done if it were not for the extraordinary goodwill of the people at the peripheral centres towards the people at the old centre. Just as we send our best to the overseas centres, so they on their part send their best to us, and only from that kind of coöperation could such papers as the *Journal of the American Medical Association*, the *British Medical Journal*, or The Lancet be produced.

In reply, Dr. L. M. McKillop expressed on behalf of the guests his extreme pleasure at the way in which they had been honoured. They had come many miles on a journey that had sometimes been wearisome, but among the many compensations they had received none had given more pleasure than the magnificent luncheon which The Lancet had provided, an evidence of kind thought for which they would ever feel indebted. The Lancet had fostered the feelings of good fellowship among members of the medical profession for over 100 years.

Dr. Edward H. Fyffe, who also responded on behalf of the guests, confirmed the sentiments of the previous speaker and said that the overseas visitors would go back to their homes with very kindly feelings for the way they had been received in the mother country.

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BRITISH MEDICAL ASSOCIATION.

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Municipal Welcome.

Early in the session the Lord Mayor of Bradford, Alderman H. M. Trotter, accompanied by the town clerk, Mr. N. L. Fleming, paid a visit to the meeting in order to welcome the Association on its first visit to Bradford. They were introduced by Mr. J. Basil Hall, M.Ch. Camb., President-Elect, who acknowledged the kindness and consideration of the civic officials at every stage in the preparations for the meeting; a real spirit of hospitality, he said, had pervaded the whole community. Alderman Trotter invited the Association to inspect the municipal undertakings—hospital and clinics—of which Bradford was justly proud, and spoke of the urgent need for more medical men in the civic councils of the country. Dr. Henry replied that the Association would examine with peculiar pleasure the municipal experiments in medical administration which had been so highly lauded and so severely criticised. The hon. local general secretary, Dr. W. N. West Watson, also welcomed the Association.

Representative Meeting.

Friday, July 18th.

After some formal business and the reading of apologies of absence, Lieut.-Col. F. O'Kinealy, I.M.S., was elected to represent the Indian Medical Service on the B.M.A. Council for 1924–27. Dr. G. E. Haslip, retiring on account of ill-health from the office of treasurer to the Association (1916–24), was elected a vice-president. Later on in the session Mr. N. Bishop Harman was elected treasurer in his place. Dr. F. G. Thomson, of Bath, was elected President of the Association for the year 1925-26, and the annual meeting of 1926 was fixed for Nottingham. Speaking to the financial sections of the report, Dr. R. A. Bolam, acting treasurer, gave an account of the Association's new house which it was proposed to enter without ceremony in March, 1925, the formal opening to take place a few days before the annual meeting at Bath later in the year. While a few minds were still hesitant about the financial commitment, the majority were evidently proud of the possession of a building with a noble hall and adequate space for all the activities of the Association. The notable services of Dr. Bolam as chairman of the B.M.A. Council in securing the new building were warmly acknowledged, as also those of Mr. L. Ferris-Scott, F.C.A., the financial secretary.

Medico-Political Matters.

Mr. E. B. Turner, chairman of the Medico-Political and Parliamentary Committee, moving the adoption of this section of the report, spoke of the lapse of the Dangerous Drugs Regulations in so far as they were irksome or deleterious to medical practitioners. The fees offered for medical examination of recruits (Navy 4s. per head, Air Force and Army 2*s.* 6*d.* per head) were totally inadequate, and opinion to that effect had been conveyed to the authorities. The fees paid to Admiralty surgeons and agents had been reduced in November last (consultation at surgery from 3*s.* 6*d.* to 3*s.* 3*d.*) and protest had proved unavailing. Fees paid to civilian medical practitioners for attendance on soldiers on furlough had undergone similar reduction; in the opinion of the Army Council protest would be unavailing so long as there is no disposition shown by members of the profession to decline to do the work at current rates. On the other hand, the concessions made by the Home Office, in a circular to chief constables, in regard to fees to doctors called to street emergencies were of a more satisfactory character. Salaries of Home Office medical officers compared very unfavourably with those of the Ministry of Health, and it was the policy of the Association to get all this medical work as well as that of the Board of Education transferred, as had been foreshadowed when the Ministry of Health was instituted to this department.

Referring to the approaching election by the Representative Body of direct representatives to the General Medical Council, Mr. Turner regarded the constituency as not large enough for a useful "P.R." vote. Put to the meeting it was decided to elect the four representatives by the block or "first past the post" system.

Use of Opium by Midwives.

On a motion by Croydon, protest was raised once again against the use of opium by midwives. Mr. Turner pointed out that three times the protest had been met by the Central Midwives Board with a blank refusal, although the use of pituitrin by midwives had been prohibited. Croydon when challenged was unwilling to bring forward any direct evidence of improper use of opium by midwives.

Consultation between Medical Witnesses.

The Representative Body had resolved in 1923 that it is desirable for medical men who may be called as witnesses in legal cases (especially under the Workmen's Compensation Act) to consult with each other before the case is heard so that they may, if possible, agree upon facts. This principle was, indeed, approved as long ago as 1905. A motion was proposed by Dr. G. H. Lowe (Cleveland):—

> That wherever possible, in cases which depend on medical evidence alone, there should be a consultation between the medical witness on both sides with a view to agreement on facts, and that such cases should be settled by an arbitrator and not by a judge in open court.

The question was asked: Does any case depend on medical evidence alone? and doubt was expressed as to the expediency (if practicable) of withdrawing cases from public trial. The motion was lost heavily.

Fees Paid to Doctors called in by Midwives.

No fee is provided in the present scale for such special service as induction of premature labour, and representation has been made to the Ministry of Health. A motion by Lewes and East Grinstead proposed:—

> That the Council be requested to approach the Ministry of Health with the object of revising the scale of fees which are paid to doctors called in on the advice of midwives, as this meeting considers the fees to be inadequate.

Dr. H. B. Brackenbury said that, although the subcommittee had never admitted that the present fees were adequate, a fair bargain had on the whole been struck. In Lancashire, it was pointed out, the scale corresponded with the fees charged to private patients under similar social conditions, and the scale was no more than the guarantee of payment if the medical man did not charge and obtain payment on his own scale. The motion was withdrawn by consent.

Approval was given to a special report of the Society of M.O.H.'s on the Midwives Act, subject to the ninth paragraph, reading:

> A midwife who acts only as a monthly nurse should be allowed freedom from supervision under the rules of the C.M.B. if she be a fully trained nurse.

Fees for Ambulance Lectures.

It was proposed by Mr. Turner, in regard to first-aid equipment in factories and the instruction how it should be used, that a fee of not less than £1 1s. per lecture be demanded. The British Red Cross Society's course was stated to be nine lectures of one and a half hours each (one hour lecture, half an hour practical), that of St. John Ambulance Association, six lectures of one hour each. After discussion the motion was carried in the following form:—

> That when a course of ambulance lectures is desired in order to fulfil or supplement the requirements laid down in Section 29 of the Workmen's Compensation Act, 1923, the fee should be a minimum of £1 1s. per lecture, with an additional fee of 1s. per head for every member of the class in excess of 21.

On the proposal of Dr. W. F. Dearden (Manchester) it was referred to the B.M.A. Council to consider whether under the Act arrangements should be made for redrafting the ambulance requirements and for continuous medical supervision of the equipment and working. On the evidence of inspectors the boxes were found to be unsatisfactory in 43 per cent. of cases.

A Benevolent Fund.

The Representative Meeting of 1923 acquiesced in the statement that "the charitable funds are a disgrace to our profession," but did not then proceed to definite action. Two motions, by South Essex and by Manchester, combined to the effect:—

> That it be an instruction to the Council to examine and report on medical benevolent funds, including the possibility of a British Medical Association Benevolent Fund.

Dr. F. Rees said that existing benevolent funds were managed by the hierarchy of the profession, and that an association of general practitioners could manage better. The R.M.B.F. had had, it was true, a large accession of membership during the past year owing to the Portsmouth discussion—600 new members with £1000 increased income; and the B.M.A. subscriptions to benevolence had increased by some £300. But as Dr. J. T. D'Ewart said, there was still little consolation for the man who was down on his luck except to "get buried quick." In its divisions the B.M.A. possessed all the machinery for collecting and administering benevolent funds. Dr. Bolam indicated that it would require about 10s. a head annually to produce even the present meagre result. That money must either come voluntarily out of the pockets of members or from an enhanced subscription. The motion to instruct the Council was carried by a large majority.

Legal Liability in Medical Certification.

The protection of medical men from litigation as a result of honest certification claimed the attention of the meeting from various aspects. Dr. David Roxburgh (Marylebone) proposed and Dr. W. J. Leighton (Preston) seconded a motion:—

> (i.) That the Council of the Association be instructed to take such steps as shall cause the liability of medical practitioners to actions at law for damages for issuing bona-fide certificates to cease; (ii.) that the methods employed to attain that end may include continuously repeated advice to all practitioners not to issue certificates except on evidence which is certain to convince a judge and jury—for example, that a patient suffering from homicidal mania or suicidal tendencies must first have succeeded in satisfying his ambition, or that a patient suffering from small-pox must first have communicated the disease to another person, &c.; and (iii.) that alternatively the law shall at once be so modified as to recognise that certain certificates are issued in the public interest, which includes that of the patient; that practitioners issuing them are public servants; that the public authorities accept the whole consequences of their errors, that actions shall only lie against the public authority, and that—if it be required—additional powers be given to the General Medical Council to deal with medical practitioners.

Dr. Roxburgh believed that the institution of proceedings against a medical man for the expression of honest opinion was no part of statutory law, he deprecated the infliction of what amounted to a fine for issuing bona-fide opinions, and he proposed his motion as a means of driving home to the public that if the medical certifier is to be tried by a jury, the evidence shall be such as will satisfy the jury. He dwelt on the psychological stress of the atmosphere in such trials and its effect on judge and jury. The motion as framed when put to the meeting was lost by a large majority.

at the same time, it should be the highest personification of nationality. Let us strive then in the pacific field of science for the pre-eminence of our several countries." The record of these strivings, of success, and of failure which is so often the precursor of success, is to be found in the pages of the paper which he represented, and more and more space will be devoted in the years to come to the record of the attainments of our overseas visitors.

Sir Squire Sprigge, the Editor, who endorsed the Chairman's words of welcome, regretted that duty had prevented the gathering from being larger, so many who had responded to the call of Imperial celebration by presence in the mother country having had to return home; but even in these circumstances the quality of the response to the invitation was significant. As an example of the spread of medical knowledge and increased facilities of inter-communication, he pointed out that in a copy of THE LANCET dated a little more than 100 years ago he found the first foreign communication: it was about half a column in length and had taken seven days to travel about 240 miles. Its appearance was considered by the editorial staff of that day to be a great event, for it was referred to at the beginning and in the middle of the paper and again commented upon in the following week. That was foreign correspondence in 1824. And now the publication of foreign correspondence from almost every part of the globe was a weekly incident. Although such effort was common to any newspaper which attempted in the smallest way to mirror the modern interchange of scientific thought, it could not be done if it were not for the extraordinary goodwill of the people at the peripheral centres towards the people at the old centre. Just as we send our best to the overseas centres, so they on their part send their best to us, and only from that kind of coöperation could such papers as the *Journal of the American Medical Association*, the *British Medical Journal*, or THE LANCET be produced.

In reply, Dr. L. M. McKillop expressed on behalf of the guests his extreme pleasure at the way in which they had been honoured. They had come many miles on a journey that had sometimes been wearisome, but among the many compensations they had received none had given more pleasure than the magnificent luncheon which THE LANCET had provided, an evidence of kind thought for which they would ever feel indebted. THE LANCET had fostered the feelings of good fellowship among members of the medical profession for over 100 years.

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SATURDAY, JULY 19TH.

ORGANISATION OF THE ASSOCIATION.

On a motion to approve that part of the report of the Council dealing with organisation, Dr. S. **MORTON MACKENZIE**, chairman of the Organisation Committee, gave a brief account of the present position of the Association. The total membership to date was, he said, 27,533, being the highest number yet recorded. Last year nearly 2800 new members joined, attracted, he thought, by the proved willingness of the Association to take up anything to help its members. The Handbook for Recently Qualified Medical Practitioners was proving useful in recruiting, and was being distributed gratis to those attending the social meetings of welcome at teaching centres. At Newcastle-on-Tyne during the last two years every newly qualified man had joined. Prizes for essays on clinical or pathological subjects were being offered to final-year students, and he thanked the examiners—Prof. G. L. Gulland (Edinburgh), Prof. A. J. Hall (Sheffield), Sir William Hale-White, and Sir H. Rolleston (London)—for their services.

South African Branches.

In South Africa, although a referendum of the whole profession had shown a majority of 190 out of 1288 voting in favour of the formation of a South African Medical Association affiliated to the B.M.A., a second referendum of members of the South African branches of the Association resulted in seven out of the ten branches (with a total membership of 700) voting against the formation of a new association. The need there was for an efficient medical organising secretary and the Association was offering to pay half the expense over a period of three years. Dr. L. G. **IRVINE** (Witwatersrand) expressed the satisfaction of that branch at the action of the B.M.A., which might justly be called an *imperial* medical association.

Approving Signatures for Membership Applications.

A motion was brought forward by Darlington disapproving of the Council's suggestion to dispense with approving signatures on forms of application for membership, and affirming that such signatures are a safeguard against the division or branch being exploited by individuals unworthy of becoming members. An interesting discussion ensued, it being contended that an approving signature is no safeguard, for the undesirable member is apt to introduce a rather more undesirable, and that the effective retort is to put the worst member of the branch on the executive and make him chairman thereof. The meeting turned down the resolution on the assurance that every divisional secretary should be ex-officio member of the branch council which admits applicants

A Woman Member of Council.

Croydon proposed that of the eight members of the B.M.A. Council elected by the Representative Body at least one shall be a woman. Dr. **HAWTHORNE** quaintly suggested that the proposal was out of order as the articles of association prohibited the conferring of privilege on any individual member or group of members, but the chairman allowed discussion to proceed. Dr. **CHRISTINE MURRELL**, a duly elected member of the Council, stated on behalf of the women members of the Association that they recognised that the Association was a democracy with no sex bar and that preferred to stand without privilege. There were in fact three women present as representatives of divisions or branches. Her statement was received with applause, and the motion was withdrawn by consent.

INDIVIDUAL DEFENCE.

Last year a proposal by Warrington that the individual defence of members in professional matters should be one of the functions of the Association was lost by a large majority. This year the question was again raised by motions from Warrington and Manchester which were combined for discussion into the clear issue:

That the B.M.A. Council be instructed to formulate a scheme for the medical defence of individual members of the Association either by itself or in coöperation with existing bodies.

Dr. J. S. **MANSON**, who again opened the discussion, described it as a recurrent question, never quite decided. Less than half the members of the Association were, he said, within the professional defence societies, although no doubt there were others assured in commercial companies. These presumably were acting for profit on some actuarial basis, and he saw no reason why the B.M.A. should not reap this harvest for itself. There was still scope, for whereas in 1912 63 per cent. of the numbers on the Medical Register were members of the Association, the proportion in 1923 was only 54·7 per cent. Need was greater, for even "token" payment to hospital staffs deprived them of their immunity from attack as honorary officers, and a proper defence department of the Association was needed to deal with chiropractors et hoc genus omne. To pass this motion would, he thought, be a fitting celebration of the twenty-first birthday of the new constitution. Dr. A. **LYNDON** (Guildford) asked, where are you going to draw your numbers for the new scheme? Excepting overseas members, who were considered ineligible for any existing scheme of individual defence, the 18,500 or so members of the Association equalled roughly the membership of the three professional defence societies. The proposal could only be justified on commercial grounds and the Association had no relevant experience behind it. He informed the meeting that the Medical Defence Union was already active in prosecuting unqualified practitioners. Dr. P. **MACDONALD** (York), admitting that defence was now efficient, argued that the Association could not afford to remain outside a matter so important to its membership. Dr. E. R. **FOTHERGILL** (Brighton) exhorted the meeting not to worry, but to get into a position to avoid appeals for help from members who had got into scrapes. Prestige suffered from such recurrent events. Even in the successfully defended action the practitioner found himself a couple of hundred pounds out of pocket. There was sufficient scope for defence in scooping up all the young men entering the profession. Dr. **BRACKENBURY**, expressing sympathy with the proposal, questioned whether it was good business at the moment. The National Union of Teachers, whose defence scheme had been cited, was, he said, preponderatingly concerned not with defence against individuals but against public bodies, and that the Association was already doing. Dr. **MORTON MACKENZIE** repeated the well-worn but weighty arguments against the proposal—it was too late in the day to begin, the opportunity had been allowed to slip, opposition from existing defence organisations was uncompromising, overseas assurance was impracticable, the proposal would not increase membership, rather the reverse: finally (a new point) the Association would lose its right of proceeding at the General Medical Council until the individual had been turned out of membership—a lengthy process. Dr. **MANSON** replied, and the motion being put was rejected by 76 votes to 58.

SCIENTIFIC SUBJECTS.

Mr. H. S. **SOUTTAR**, chairman of the Science Committee, in asking for approval of his section of the Council's report, remarked on the brilliant work presented for the scholarships which could have been allocated three times over. The Sir Charles Hastings Clinical Prize was offered with the object of stimulating systematic observation, research, and record in general practice, the proper sphere of research being always among a practitioner's own patients. On the motion of Sheffield the Council agreed favourably to consider the award of supplementary prizes in the event of more than one essay of merit being sent in. Dr. H. **CAIGER** mentioned the cause of appendicitis as a fitting object of general practitioner

CERTIFICATES UNDER THE LUNACY ACTS.

Dr. C. O. **HAWTHORNE** (Marylebone) then proposed and Dr. F. W. **GOODBODY** (Marylebone) seconded a motion to the effect:—

> That the provision of a certificate under the Lunacy Acts by a qualified medical practitioner should be an act having the legal status of testimony given by a witness in a court of law, and should not render the practitioner liable either to any civil action or to any criminal charge, except in so far as the certificate may be shown to contain statements of essential importance which are proved to be inaccurate and to have been made with a wilful and deliberate intention; to deceive.

Dr. Hawthorne said that the responsibility of certifying was accepted by the medical profession largely in the public interest. It was a heavy and, to many of them, an obnoxious responsibility, and the great majority of the medical profession would be glad to be relieved of it altogether. As the law stood the medical profession was the sole agency standing between the community and the person of unsound mind, and the sole agency by which persons of unsound mind were protected against themselves. Hence, though there was no legal compulsion on the medical practitioner to sign the certificate, the moral pressure in the great majority of cases was such that the practitioner felt himself, in the interests of the community and the patient, and for the credit of the profession, morally compelled to accept the responsibility attaching to the signature of a lunacy certificate.

The law recognised that the signing of the certificate was a public service by providing a certain measure of protection for the practitioner who signed it. Thus no action by a patient against a certifying practitioner relative to the certificate could succeed if the practitioner was able to show that, in the words of the Act of Parliament, he had acted "in good faith and with reasonable care." More than that, if an action was brought, the judge of the High Court would bring the proceedings to a prompt conclusion if the practitioner could satisfy the Court that there was no ground whatever for the suggestion that he had failed to act in good faith and with reasonable care. Dr. Hawthorne said that those two provisions formed a measure of protection of very great value, and were appreciated by the medical profession. But they were not adequate, because they left it still possible for an action to be begun against a practitioner, and, if there were some verbal or technical flaw either in the certificate or in any other part of the proceedings, the case might be forced into court, and the practitioner might be put to the expense, annoyance, and strain which were always involved in legal proceedings. In a word, no one signed a lunacy certificate without having before his eyes the fear that the signature might bring on him the penalty for an illegal action.

Partial Protection to be made Complete.

"My suggestion," said Dr. Hawthorne, "is that the protection which is now partial shall be made complete, and that the medical practitioner shall be placed in the same position as a witness who gives testimony in a court of justice. That is to say, for what he does in his capacity as a certifying practitioner he shall not be exposed to the chance of a legal action."

It might be urged that it was in the public interest that medical practitioners should be encouraged, when necessity demanded it, to sign these certificates. He submitted also that in signing such a certificate the medical practitioner, as a matter of fact, was only acting the part of a witness. He was giving evidence both of fact and of opinion before a judicial authority, and it was open to the judicial authority either to accept the evidence or to reject it, or to determine that he would not act until after further inquiries. "That is to say," said Dr. Hawthorne, "the voice which sends the patient into a lunatic asylum is the voice of the law, and all the medical practitioner does in connexion with the transaction is to give evidence of fact and to express an opinion." He went on to point out that the judicial authority who took part in the proceedings was completely protected. What he did or abstained from doing could not possibly be challenged by the person who by his signature was sent to a lunatic asylum. If the judicial authority enjoyed complete immunity from legal challenge surely the medical authority should have the same measure of protection.

The Solicitor's View.

Mr. W. E. **HEMPSON**, solicitor to the Association, congratulated Dr. Hawthorne on his clear and accurate exposition of the law. In the last 30 years he had had on many occasions to make use of Section 330 of the Act, which was the protective section to which Dr. Hawthorne had referred. He had found that when an action had begun in the courts and had proceeded up to a certain point, there was a disinclination on the part of the Master in Chambers, before whom the matter went in the first instance, and on the part of the judge, to whom appeal could be made, to dismiss that action if there was the slightest possibility of the plaintiff succeeding in it. If, he said, you had the Master against you in the first instance, even though you carried it to the Court of Appeal, you had very great difficulty. What Dr. Hawthorne wanted, apparently, was that no action should be permitted to be raised without official authority to that end. There were certain actions at law which could not be begun without the fiat of the Attorney-General, and it seemed to him that this would be a way of dealing with this question. Facts and affidavits would be supplied, and it would be in the power of the Attorney-General to refuse his fiat, in which case no action could be brought; or the fiat might be granted if there were circumstances to which the last part of the resolution referred. At present any litigant who could get a solicitor to act for him could go to the courts and issue his writ, and thus take the action up to the point at which the protective section for the dismissal of the action was reached. Dr. Hawthorne, he took it, wanted the matter to be put on some such footing as this: that unless some element as that alluded to in the last part of the resolution was shown to exist, the action could not be issued nor the writ set in motion.

The Question of Negligence.

Dr. **BRACKENBURY** drew attention to the question of negligence. What about the case, he asked, where a doctor had so neglected his duty as to make only a perfunctory examination—where he had been negligent in getting the information on which to found the certificate? The statement in the certificate might be inaccurate, but might be bona fide. The resolution, it seemed to him, would allow the negligent doctor to get off scot-free.

Mr. **HEMPSON** said he thought that Dr. Hawthorne was aiming at the highest he could get. He thought it very probable that they would have to accept less. Of course, if they got a change on the lines of Dr. Hawthorne's resolution the question raised by Dr. Brackenbury would arise. What they wanted was a change in the law as near Dr. Hawthorne's proposals as they could get, with modifications to provide for the point raised by Dr. Brackenbury.

Mr. E. B. **TURNER** expressed the hope that one of the duties of the committee of the B.M.A. Council which was dealing with this matter would be the preparation of evidence to place before the Royal Commission.

Dr. **HAWTHORNE**, in replying, suggested that negligence was a mere spectre. It was unthinkable that both doctors signing a certificate should fail to describe accurately the things they had seen and heard.

The resolution on being put to the meeting was agreed to with unanimity and enthusiasm, and the B.M.A. Council was asked to consider the question of preparing evidence to lay before the Royal Commission.

SATURDAY, JULY 19TH.

ORGANISATION OF THE ASSOCIATION.

On a motion to approve that part of the report of the Council dealing with organisation, Dr. S. **MORTON MACKENZIE**, chairman of the Organisation Committee, gave a brief account of the present position of the Association. The total membership to date was, he said, 27,533, being the highest number yet recorded. Last year nearly 2800 new members joined, attracted, he thought, by the proved willingness of the Association to take up anything to help its members. The Handbook for Recently Qualified Medical Practitioners was proving useful in recruiting, and was being distributed gratis to those attending the social meetings of welcome at teaching centres. At Newcastle-on-Tyne during the last two years every newly qualified man had joined. Prizes for essays on clinical or pathological subjects were being offered to final-year students, and he thanked the examiners—Prof. G. L. Gulland (Edinburgh), Prof. A. J. Hall (Sheffield), Sir William Hale-White, and Sir H. Rolleston (London)—for their services.

South African Branches.

In South Africa, although a referendum of the whole profession had shown a majority of 190 out of 1288 voting in favour of the formation of a South African Medical Association affiliated to the B.M.A., a second referendum of members of the South African branches of the Association resulted in seven out of the ten branches (with a total membership of 700) voting against the formation of a new association. The need there was for an efficient medical organising secretary and the Association was offering to pay half the expense over a period of three years. Dr. L. G. **IRVINE** (Witwatersrand) expressed the satisfaction of that branch at the action of the B.M.A., which might justly be called an *imperial* medical association.

Approving Signatures for Membership Applications.

A motion was brought forward by Darlington disapproving of the Council's suggestion to dispense with approving signatures on forms of application for membership, and affirming that such signatures are a safeguard against the division or branch being exploited by individuals unworthy of becoming members. An interesting discussion ensued, it being contended that an approving signature is no safeguard, for the undesirable member is apt to introduce a rather more undesirable, and that the effective retort is to put the worst member of the branch on the executive and make him chairman thereof. The meeting turned down the resolution on the assurance that every divisional secretary should be ex-officio member of the branch council which admits applicants

A Woman Member of Council.

Croydon proposed that of the eight members of the B.M.A. Council elected by the Representative Body at least one shall be a woman. Dr. **HAWTHORNE** quaintly suggested that the proposal was out of order as the articles of association prohibited the conferring of privilege on any individual member or group of members, but the chairman allowed discussion to proceed. Dr. **CHRISTINE MURRELL**, a duly elected member of the Council, stated on behalf of the women members of the Association that they recognised that the Association was a democracy with no sex bar and that preferred to stand without privilege. There were in fact three women present as representatives of divisions or branches. Her statement was received with applause, and the motion was withdrawn by consent.

INDIVIDUAL DEFENCE.

Last year a proposal by Warrington that the individual defence of members in professional matters should be one of the functions of the Association was lost by a large majority. This year the question was again raised by motions from Warrington and Manchester which were combined for discussion into the clear issue:

That the B.M.A. Council be instructed to formulate a scheme for the medical defence of individual members of the Association either by itself or in coöperation with existing bodies.

Dr. J. S. **MANSON**, who again opened the discussion, described it as a recurrent question, never quite decided. Less than half the members of the Association were, he said, within the professional defence societies, although no doubt there were others assured in commercial companies. These presumably were acting for profit on some actuarial basis, and he saw no reason why the B.M.A. should not reap this harvest for itself. There was still scope, for whereas in 1912 63 per cent. of the numbers on the Medical Register were members of the Association, the proportion in 1923 was only 54·7 per cent. Need was greater, for even "token" payment to hospital staffs deprived them of their immunity from attack as honorary officers, and a proper defence department of the Association was needed to deal with chiropractors et hoc genus omne. To pass this motion would, he thought, be a fitting celebration of the twenty-first birthday of the new constitution. Dr. A. **LYNDON** (Guildford) asked, where are you going to draw your numbers for the new scheme? Excepting overseas members, who were considered ineligible for any existing scheme of individual defence, the 18,500 or so members of the Association equalled roughly the membership of the three professional defence societies. The proposal could only be justified on commercial grounds and the Association had no relevant experience behind it. He informed the meeting that the Medical Defence Union was already active in prosecuting unqualified practitioners. Dr. P. **MACDONALD** (York), admitting that defence was now efficient, argued that the Association could not afford to remain outside a matter so important to its membership. Dr. E. R. **FOTHERGILL** (Brighton) exhorted the meeting not to worry, but to get into a position to avoid appeals for help from members who had got into scrapes. Prestige suffered from such recurrent events. Even in the successfully defended action the practitioner found himself a couple of hundred pounds out of pocket. There was sufficient scope for defence in scooping up all the young men entering the profession. Dr. **BRACKENBURY**, expressing sympathy with the proposal, questioned whether it was good business at the moment. The National Union of Teachers, whose defence scheme had been cited, was, he said, preponderatingly concerned not with defence against individuals but against public bodies, and that the Association was already doing. Dr. **MORTON MACKENZIE** repeated the well-worn but weighty arguments against the proposal—it was too late in the day to begin, the opportunity had been allowed to slip, opposition from existing defence organisations was uncompromising, overseas assurance was impracticable, the proposal would not increase membership, rather the reverse: finally (a new point) the Association would lose its right of proceeding at the General Medical Council until the individual had been turned out of membership—a lengthy process. Dr. **MANSON** replied, and the motion being put was rejected by 76 votes to 58.

SCIENTIFIC SUBJECTS.

Mr. H. S. **SOUTTAR**, chairman of the Science Committee, in asking for approval of his section of the Council's report, remarked on the brilliant work presented for the scholarships which could have been allocated three times over. The Sir Charles Hastings Clinical Prize was offered with the object of stimulating systematic observation, research, and record in general practice, the proper sphere of research being always among a practitioner's own patients. On the motion of Sheffield the Council agreed favourably to consider the award of supplementary prizes in the event of more than one essay of merit being sent in. Dr. H. **CAIGER** mentioned the cause of appendicitis as a fitting object of general practitioner research, the disease apparently arising on the contact of a primitive nation with civilisation. Mr. Souttar spoke of the appointment of a special committee to inquire into cardiac disease in childhood, which was really a group research undertaken at the instigation of its originators. He commended the practice to other groups.

National Health Insurance.

In moving the approval of this section of the report Dr. H. B. **Brackenbury**, chairman of the Insurance Acts Committee, described it as a record of familiar matters. A report was being prepared for submission to the Royal Commission, the notice being shorter than expected, for the Committee had to be prepared to submit evidence by Jan. 1st, 1925. If time permitted this interim report would be circulated for discussion by the divisions of the Association.

At the conclusion of the morning session the announcement was made amidst applause of the election of Dr. Brackenbury as chairman of the Representative Body for 1924–25.

Election of Members of Council.

The election of 12 members of Council by grouped representatives was reported as follows: Dr. G. B. Hillman, Dr. I. W. Johnson, Dr. J. W. Bone, Dr. T. Ridley Bailey, Mr. E. B. Turner, Dr. W. Paterson, Dr. C. E. S. Flemming, Dr. S. Morton Mackenzie, Dr. C. E. Douglas, Dr. J. McGregor-Robertson, Dr. R. B. Mahon, Dr. J. Singleton Darling; all being unopposed except Dr. Johnson and Dr. Bailey.

Election of Direct Representatives to the G.M.C.

The election by the Representative Body of four from among its membership for nomination as direct representatives to the General Medical Council resulted in the following being proposed: Dr. R. A. Bolam, Dr. H. B. Brackenbury, Dr. J. A. Macdonald, Sir Jenner Verrall.

Hospital Policy.

An important debate was initiated on the motion of Mr. **Bishop Harman**, who moved a recommendation of the Council that contributions to hospitals either by employers of labour or in the form of massed contributions from employees should be considered as contributions for services rendered.

An amendment proposing that contributions to hospitals for which a return of service was definitely stated should be the only ones from which any payment to the visiting staff should be made led to a long and interesting discussion, which showed the general desire of the representatives to maintain the voluntary policy. The amendment being withdrawn the resolution failed to obtain the necessary two-thirds majority.

Monday, July 21st.

Voluntary Hospitals.

The policy of the Association towards voluntary hospitals was the subject of many resolutions on the agenda which were crystallised by a motion from Mr. **Bishop Harman** to the effect that:—

> "Where the board of a voluntary hospital receives contributions from individuals in return for or in anticipation of treatment the members of the visiting medical staffs should receive recognition of their services, either in the form of an agreed honorarium or by means of a percentage of all such payments being passed into a special fund. Such honorarium or fund can be allocated *in any manner* which the visiting medical staff may determine."

After a long debate on the main resolution and on the vital amendments, Mr. Bishop Harman's motion was carried by a considerable majority.

The Ethics of Advertising.

A report from the Ethical Committee was submitted by Dr. Langdon-Brown, in which was proposed a number of restrictions as regards advertising or alleged advertising by members of the medical profession. The report was adopted with certain reservations. (*To be continued.*)

IMPERIAL CANCER RESEARCH FUND.

ANNUAL REPORT.

THE annual meeting of the Imperial Cancer Research Fund was held at the Examination Hall, Queen-square, London, W.C., on July 23rd. The Duke of Bedford presided. Dr. Sidney Martin, F.R.S., chairman of the executive committee, proposed the adoption of the twenty-second annual report, and said:—

"In proposing the adoption of the annual report it has been the custom for the chairman of the executive committee to give a summary of the report of the Director, but with your permission I shall take a somewhat wider view, and on the basis of the contents of the eighth scientific report[1] I shall survey the study of the varied aspects of the cancer problem under the different scientific disciplines which at present are engaged upon it. And firstly, as the oldest, I shall consider the clinical study of cancer in man. This is represented in the eighth scientific report by the monograph of Dr. Alexander Scott on the paraffin dermatoses and paraffin cancer. The executive committee authorised its inclusion in the report because of its unique features, which are the long-continued, careful observation on a fairly large body of workmen exposed continuously to a peculiar form of chemical irritation known, for a long time, to induce cancer. The acute and chronic skin lesions in workers in crude paraffin are described and figured in a series of beautiful plates made from Dr. Scott's own photographs. The relation of these lesions to the subsequent development of cancer is gone into, on the evidence of the individual histories of the workmen, and the whole body of facts surveyed with a masterly grasp of detail. I need only draw your attention to the absence of any close relation between the intensity of the acute early lesions and the later development of cancer, so that in some individuals only extremely slight indications of skin irritation preceded its development. Another point to be noted is the long number of years, never less than 15–20, after which the disease began. The proportion of the workers in which cancer developed was found to be less than 2 per cent. per annum of those engaged, and Dr. Scott shows that it is mainly in the men engaged in certain stages of the preparation of paraffin oil from shale that these cases occur. On the basis of his findings a very complete and, it may confidently be hoped, effective preventive régime has been instituted by the Scottish Oils Company. It has already reduced the incidence of the acute irritative disturbances in the operatives, but its effect on the occurrence of cancer in them can only be seen after a longer lapse of time.

"The executive committee desire to thank Dr. Archibald Leitch, the director of the Research Department of the Cancer Hospital, for allowing the publication in Dr. Scott's paper of a summary of his results in testing the crude and refined oils supplied by Dr. Scott for their carcinogenic powers on animals. These results confirm the importance of the unrefined oils incriminated by Dr. Scott and show the innocuousness of the refined product. This fact should serve to reassure those who have been using refined paraffin medicinally and may have become alarmed by these reports of the production of paraffin cancer.

"In the domain of experimental pathology there are three papers in the report, two by Dr. B. R. G. Russell and one by Dr. J. A. Murray. Experimental pathology may be regarded as an extension of the methods of clinical study to disease as it occurs in animals under controlled conditions. Dr. Russell's papers deal with the production of sarcoma in mice and rats by the subcutaneous inoculation of tar. These observations emphasise the fundamental unity of the cancer process as it occurs in connective tissues (sarcoma) and in epithelial tissues (carcinoma). Dr.

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[1] An exhaustive analysis of this valuable report appeared in THE LANCET, Dec. 22nd, 1923, p. 1368.

Murray's paper deals with the meaning of the long period—10 to 20 years in man, 5 to 12 months in mice—during which cancer-producing agents must act before the disease sets in, and the paradoxical result that once an animal has become cancerous there is an apparent incapability to react anew with cancer development to fresh applications of tar to another part of the body. These observations illuminate the rarity of multiple primary cancer. The space devoted to histological details in these papers is merely an expression of the importance of the microscopic control which enters at every stage of what is essentially a clinical or biological study of new growths.

“ Dr. A. M. Begg's paper on dissemination in tar cancer belongs more strictly to the province of pathological histology. It is entirely descriptive, and deals with peculiarities in the mode of spread of the epithelioma, particularly along the sheaths of the nerves.

“ Experimental cytology is represented by the work of Dr. A. H. Drew on tissue culture. His work clears up to a great extent the hitherto enigmatical departures from the normal histological picture met with in malignant new growths, showing how this phenomenon can be duplicated in normal tissues, or, on the other hand, how atypical undifferentiated malignant new growths can be made to assume the normal form without loss of their fundamental malignant characters. He has also shown the close relationship between the processes of growth in malignant cells and those responsible for repair of injury.

“ The remaining papers are biochemical in nature. Biochemical investigations are of two kinds: those which apply the methods and reactions of chemistry to the study of the behaviour of living organisms, and those in which, for want of test-tube reactions, the reactions of living organisms are used to demonstrate the presence or absence of chemically active substances or to elucidate their rôle in the animal economy. Dr. Russell's papers on carbohydrate metabolism of normal and cancer cells belong to the former category; Dr. W. Cramer's work on vitamins to the latter. Dr. Russell's investigations, which grew out of a study of cell respiration, have led to the discovery of certain sugar reactions (analogous to those used in the separation of nearly related bacterial species) which are apparently peculiar to cancer cells. They are being made the starting-point of chemotherapeutic experiments. Dr. Cramer's vitamin work deals objectively with an aspect of cancer growth, which has led to a great deal of loose speculation. He shows that when put to the test of direct experiment, no degree of vitamin deficiency compatible with life has any effect on malignant proliferation.

“ From this survey you can see that the work in our laboratory embraces a very comprehensive series of investigations touching varied aspects of the cancer problem, all of them of fundamental importance. The achievements of the past warrant us in meeting the future with sober optimism, and give me confidence in recommending to you the adoption of the twenty-second annual report.”

Sir John Bland-Sutton, F.R.C.S., seconded the motion, which was adopted.

Reports of Executive Committee, Director, and Hon. Treasurer.

The executive committee report with regret the resignation of Sir William Church from the chairmanship of the committee, in which he has been succeeded by Dr. Sidney Martin, F.R.S.; Sir William Church becomes a vice-president of the Fund. They record that the “ Stroud Laboratory ” at Mill Hill is now nearing completion, and is expected to be in working order within the next month. During the year material from the laboratories of the Fund has been supplied to ten investigators working in this country, and also to workers in Amsterdam, Brussels, Strasburg, and Brazil. On the other hand, material for investigation has been received by the Director from other laboratories. A list of the papers published from the laboratory during the year is appended.

Dr. J. A. Murray, the Director, summarises the papers in the eighth scientific report referred to by the Chairman. He states that the investigations on the venereal sarcoma of dogs and on the infectious sarcoma of fowls have been interrupted by the removal of the country laboratory to new premises, and the delay which has occurred in erecting the new laboratory. In consequence, Dr. Begg's work under the Atholstan Grant on these tumours is not yet far enough advanced for publication. The experiments on the production of lymphomatous tumours in mice, carried out to test the conclusions of Dr. James Young, have proved entirely negative, even when carried out with cultures of the supposed causal organism, kindly supplied by Dr. Young himself.

Sir George Makins, the hon. treasurer, reports that subscriptions and donations have amounted during the past year to £1335, an increase of £383 over the previous year, and, in addition, a grant of £500 has been received from the Worshipful Company of Goldsmiths. Legacies amounted to £5403 10*s*. 6*d*., against £3675 15*s*. 6*d*. last year: hence the total receipts, apart from dividends from investments, amounted to £7239. The general research expenditure has increased during the past year, excluding the Mill Hill and Stroud Laboratory account, by £2326 9*s*. 5*d*. This is largely accounted for by additional material, instruments, and chemicals, the publication of the eighth scientific report, and by the salaries of two additional members of the scientific staff.

The President's Speech.

The Duke of Bedford, in moving a vote of thanks to the executive committee, commenced by testifying to the loss sustained by the death of Sir John Tweedy, who had taken the greatest interest in the Fund for many years past as a member of the general committee. He went on to welcome Sir George Newman, the chief officer of the Ministry of Health, who had joined that body, and to congratulate Sir George Makins on a good financial year, and a substantial increase in the amount of subscriptions and donations. He referred to the approaching completion of the Stroud Laboratory at Mill Hill, provided, free of cost to the Fund, by the executors of the estate of the late Mr. Augustus C. Stroud. He concluded by explaining the relations between the Fund and the British Empire Cancer Campaign. It is now satisfactory, he said, to hear that the provisions formerly thought necessary by this Fund have been adopted, so that under the new articles of association of the British Empire Cancer Campaign an advisory committee is appointed consisting of members of the Royal Society and of the Medical Research Council to advise on the allocation of funds for scientific research; and the Imperial Cancer Research Fund has appointed representatives on the Grand Council of the Campaign.

A cordial vote of thanks to the Duke of Bedford for presiding at the meeting having been proposed by Sir Humphry Rolleston, Bart., the proceedings terminated.

MEMORIAL TO THE LATE MR. G. P. NEWBOLT.—A fund has been opened to establish a memorial to the late Mr. Newbolt in the Royal Southern Hospital, Liverpool, where he had filled the post of senior surgeon for a quarter of a century. The organising committee has deemed it fitting that, in addition to a portrait of Mr. Newbolt, the memorial might take the form of carrying out certain improvements in the hospital that Mr. Newbolt had at heart. These are: (1) the extension of the X ray department; and (2) provision of additional accommodation for the nursing staff. Donations may be sent to Mr. Lyon H. Maxwell, hon. treasurer, at the hospital, or to any of the members of the Memorial Committee, whose names will be found in our advertisement columns.

[illegible]

[illegible] outbreak of this [illegible] Williamson in THE [illegible] was dealing with [illegible] described by Dr. David [illegible] Epidemic Pleurodynia in [illegible] of May of this year. The [illegible] occurred in a large infirmary in [illegible] 1238 boy inmates. 141 were [illegible] symptoms were, after a short period [illegible] in the chest or abdomen, headache, [illegible] total duration of the fever was from [illegible] convalescence was rapid, and there [illegible]. No reference is made to the presence [illegible] friction—perhaps the stethoscope was not used. Laboratory investigations were thoroughly carried out with negative results. [illegible] also gives references in medical literature [illegible] similar outbreaks in other parts of America, and [illegible] interesting to read the various descriptive titles [illegible]. Amongst these are "The Devil's grip," "Intercostal myositis," "Dengue," and "Epidemic transient diaphragmatic spasm." Dr. Williamson has supplied [illegible] another name, and his clinical findings seem to justify the term epidemic pleurisy. Perhaps the illness is not severe enough to attract the attention of public health authorities, but any further experiences of this condition from those in charge of schools or other institutions would be welcomed.

I am, Sir, yours faithfully,

July 21st, 1924. G. A. SUTHERLAND.

CAPT. KATER'S "PULSEOMETER"?

To the Editor of THE LANCET.

SIR,—Some remarkable antiquated instruments have been recently presented to the Museum of the Royal College of Surgeons of England by Miss Rundle, niece of their deceased owner, Mr. Henry Rundle, F.R.C.S., consulting surgeon to the Royal Portsmouth Hospital. Many were clearly out of date and must be considered as the stock of a predecessor. Among them is a Quain's stethometer of the second pattern, as modified on the suggestion of Coxeter. It is figured and described in the *Medical Times and Gazette* (1862, i., 595). Sir Richard Quain's original stethometer had been already figured and described in the same manner in THE LANCET, vol. i., 1851, p. 126.

Another dial-bearing instrument remains enigmatical. The following words are distinctly printed on the dial: "H. Kater Invr. Gilbert & Son, London." It is a cylindrical brass instrument, nearly 2 inches in height, with an enamelled dial, as in a watch, an inch and a half in diameter. This dial is marked to 100, subdivided into 10 parts, and a large indicating hand works from the centre. Its lower part is occupied by a lesser dial divided into 12 parts, and furnished with a smaller indicating hand. This dial is supported on a tripod, three brass rods fixed on a platform, a circular brass plate which screws on to the cylinder. There is a space of about 1 inch between the dial and a split pin on the centre of the platform. The larger indicating hand is governed by a small cog inside the dial, which was probably turned either by a piece of elastic or a spring, now absent, but it must have stretched between two fittings one of which is fixed in the pin of the cog-wheel of the large indicating hand, while the other was fitted into the split pin in the centre of the platform. The small cog of the larger hand rotates the big wheel on the small dial, which is gauged to 1 in 100. The brass cylinder is perforated by 24 circular holes a quarter of an inch in diameter—the object of this arrangement is not clear.

The nature of this instrument is mysterious. Mr. [illegible] Hopkins, a surgeon's cutler of nearly 60 years' experience, maintains that it is probably a pulse-counter, having known similar contrivances that were in use many years ago. This instrument bears the name of Capt. Kater, F.R.S. (1777–1835), a man of science whose life is recorded at some length in the "Dictionary of National Biography" and the "Encyclopædia Britannica." Numerous scientific memoirs are noted, but though Kater took a share in a work on cataract by Guthrie, there is no mention of any contrivance for use in medical research. I have consulted many of our elder physicians, and the librarians of the Royal Society of Medicine and of the Royal Colleges of Physicians and Surgeons, but after long research, for which I feel much indebted to these gentlemen, no mention of this "pulse-ometer" can be found, nor have any of them ever seen this contrivance.

Yet here is a sample preserved in the Museum of the Royal College of Surgeons. There must be others in existence, so perhaps some reader of THE LANCET can throw a little light on the subject. Mr. W. Finerty, assistant in the Museum, has carefully examined its mechanism, and the result is, as Sir Arthur Keith and myself admit, that there is no government over the control of the hands, and no mechanism for regulating time. Who can fill in the *hiatus valde deflendus?*

I am, Sir, yours faithfully,

ALBAN DORAN, F.R.C.S.,

Consulting Surgeon to the Samaritan Free Hospital.

The Museum, Royal College of Surgeons of England,
July 18th, 1924.

THE DILETTANTE RADIOLOGIST.

To the Editor of THE LANCET.

SIR,—Both at home and abroad radiologists are complaining of the havoc wrought by the dilettante in X ray treatment, and therefore your leading article of to-day's date is topical. The problem is delicate, the more so because radiology is still in its infancy, and the expert of to-day may, if he does not keep abreast of the times, be the dilettante of to-morrow. We cannot, in fact, draw a hard-and-fast line between the skilled and unskilled radiologist, and even the former must occasionally have unlucky experiences, either in person or among his patients. These considerations ought not, however, to divert us from a careful consideration of the means to be adopted in an attempt to bring X ray accidents down to the irreducible minimum. The procedure to which some radiologists would perhaps subscribe is the institution of an examination in radiology and the granting of a special diploma without which no one would be expected to give X ray treatment. You refer to the procedure without enthusiasm. The multiplication of special diplomas is regarded with disfavour by many for a variety of reasons, most of which leap to the eye. It might be argued forcibly that to discourage and almost forbid the practice of X ray treatment, save in the case of holders of some special diploma, would be to make too great an incursion into the liberty of doctors, and that the precedent thus created might have undesirable consequences It might, for example, lead to the suggestion that in other fields of therapeutics a similar tacit or implied veto should be imposed. The expert, or the physician who considered himself an expert, in the administration of tuberculin might plead for a special tuberculin licence, arguing that tuberculin may be a lethal weapon in the hands of the less expert. The same argument would be applicable to the administration of insulin, which requires greater care and knowledge than the prescription of castor-oil.

The analogies are not sound, and radiology is in a peculiar position. In some respects it is comparable with aviation. An ordinary diploma to practise medicine may be compared with a licence to drive a motor-car, and a special diploma in radiology with an aviator's certificate. A highly skilled mechanic may be perfectly qualified to drive others in a motor-car, but if he were not a fully qualified aviator we would not trust him to take us for a flight. With growing knowledge of the risks of X ray treatment, the public may require of the practitioner giving X ray treatment that he possess a special diploma or can show other evidence of expert knowledge in this field. And to protect himself in case of mishaps and consequent lawsuits, the practitioner who gives X ray treatment may find a special diploma of great value. These things must be borne in mind.

I am, Sir, yours faithfully,

July 19th, 1924. SPECIALIST IN OTHER FIELDS.

The Services.

ROYAL ARMY MEDICAL CORPS.

PROMOTION EXAMINATIONS.

THE King's Regulations have been amended so as to provide that, as from April 1st, 1925, a major of the Royal Army Medical Corps before promotion to lieutenant-colonel will be examined in the subjects laid down in Appendix X. of the Regulations. The examination in these subjects may be taken at any time after an officer's promotion to the substantive rank of major, provided that the candidate can produce a certificate from a D.D.M.S. or an A.D.M.S. to the effect that he has received instruction in the subjects covered by the examination, and that he is considered fit to present himself for examination. In order to assist officers in their preparation for this examination all necessary arrangements will be made for the adequate instruction of majors, Royal Army Medical Corps, in army medical organisation and administration, hygiene, and the employment of the medical services in peace and war. This instruction will be carried out by means of lectures followed by discussions, war games, and field exercises, by the attachment of officers to the different departments in hospitals and, where possible, to the offices of administrative medical officers, for instructional purposes.

TERRITORIAL ARMY.

N. W. Hammer, D. L. Kerr, and P. J. Stokes to be Lts.

Lt. W. B. A. Lewis (late King's Shropshire L.I.) to be Lt.

Sanitary Companies: Capt A. S. Hebblethwaite (late R.A.M.C., T.F.) to be Maj. and to comd. 6th (Northern) Sanitary Company.

Supernumerary for service with the O.T.C.: Capt. W. E. Le Gros Clark (late R.A.M.C., S.R.) to be Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. (D.) T. B. Cooper, W. M. Bull, G. K. MacLennon, and W. H. Hume (proby.) to the *Victory*, and to R.N. Hospital for training.

ROYAL AIR FORCE.

The undermentioned are transferred to the Reserve, Class D.2: Squadron Leader E. P. Punch, and Flight Lts. C. H. B. Thompson and B. C. W. Pasco.

INDIAN MEDICAL SERVICE.

Maj. (now Lt.-Col.) G. Browse relinquishes the actg. rank of Col. on ceasing to hold the appt. of A.D.M.S. (Nov., 1919).

Capt. J. H. Barrett relinquishes his temp. commn.

THE LATE DR. A. MANTLE.—Dr. Alfred Mantle, of Swan-road, Harrogate, who died suddenly on July 10th while on a visit to a professional colleague in the town, was in his seventieth year. He received his medical education in the London Hospital, graduating M.R.C.S. Eng. in 1873 and M.B. Durh. in 1880. Two years later he obtained the M.D. Durh., and in 1893 the M.R.C.P. Lond. He commenced practice in Halifax and became one of the senior physicians to the Halifax Royal Infirmary. He held for a time the office of president of the Halifax Medical Society and the Bradford Medico-Chirurgical Society. About 1903 he settled in Harrogate, and later became president of the Harrogate Division of the B.M.A. and of the Harrogate Medical Society, and a trustee of the Holt Homes at Harrogate for Halifax people. Dr. Mantle published articles in the medical press, dealing mainly with the ætiology and treatment of rheumatism, and a short time ago won an international prize of £120 for an essay on the subject of rheumatism, and earmarked the sum for the benefit of children suffering from rheumatism and consumption.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, JULY 16TH.

Smoke Abatement Bill.

Earl DE LA WARR moved the second reading of the Public Health (Smoke Abatement) Bill, which he said was designed to amend the law relating to smoke nuisances. The measure was on similar lines to those introduced on two previous occasions. The only hope of getting the Bill passed this session was by general agreement.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, JULY 16TH.

Modern Sewage and Water Systems in Britain.

Mr. WALTER BAKER asked the Minister of Health how many local authorities in this country had not installed modern sewage and water systems owing to their inability to raise the necessary financial assistance.—Mr. WHEATLEY replied: I regret that I have no information of the number of authorities who have not installed modern sewage and water systems because of lack of means.

Evidence before Lunacy Commission.

Mr. ROBERT RICHARDSON asked the Minister of Health whether his attention had been called to a circular letter issued by the Secretary to the Royal Commission on Lunacy, intimating to those desirous of giving evidence before it that in the event of their application being "turned down" they would not be notified of this decision, but would be left in uncertainty for an indefinite period; and would he take steps to see that some more satisfactory procedure was adopted and, further, that a reason for rejection of the evidence should be given, in order that the public might feel no lack of confidence in the selection of evidence made by the Commission.—Mr. GREENWOOD replied: The hon. Member has been misinformed as to the terms of the letter to which he refers. A very large number of persons have already applied to give evidence before the Royal Commission; and, in the meantime, such persons have been informed that their applications will receive consideration, and that if the Commission decide to hear evidence from them, a further communication will be sent. I should add that the procedure of a Royal Commission is entirely within its own discretion.

Hospitals and Sanatoria in Rural Districts.

Mr. ERNEST BROWN asked the Minister of Health whether any document was in the possession of his department showing the number of hospitals, isolation hospitals, tuberculosis sanatoria, asylums for the mentally defective, and Poor-law institutions situated in agricultural parishes; and if he would make it available to Members of the House for county constituencies.—Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) replied: My right hon. friend is afraid that no document giving the information which the hon. Member has in mind is available. He will be glad, however, to endeavour to obtain information as regards any particular parish for which hon. Members may ask.

Dust and Refuse Heaps in London.

Mr. GILBERT asked the Minister of Health whether his department had recently considered the question of dust and refuse disposal in London and greater London; whether he was aware that there were now several refuse dumps in the lower reaches of the Thames which were burning through self-combustion, and were a great nuisance to the districts concerned; and whether, in view of the importance of the subject, he would consider as to a committee being set up to fully consider the matter, in view of the development of new housing schemes outside London.—Mr. GREENWOOD replied: A list of special precautions in connexion with refuse tips was prepared by my department in 1922, in consultation with local authorities; and my right hon. friend is advised that, where these precautions are observed, nuisances are avoided. He is having special investigations made as to the conditions in the lower reaches of the Thames.

Pension Scheme for Nurses.

Mr. ATHOLL ROBERTSON asked the Minister of Health whether he could see his way to establish a pension scheme for nurses on a contributory basis, with substantial aid from the State, for all nurses that had faithfully and continuously served public bodies, hospitals, and other institutions, and give assistance to the private nurse in a fair and reasonable way.—Mr. GREENWOOD replied : While my right hon. friend is in sympathy with the object which the hon. Member has in view, he is advised that the adoption of such a scheme as is suggested would be wholly impracticable.

Deaths from Vaccination.

Mr. BROAD asked the Minister of Health how many death certificates were sent in during the year 1923 in which the words vaccination or vaccine occurred ; what were the ages of the persons to whom these certificates referred ; and how these deaths were ultimately classified.—Mr. WHEATLEY replied : The words in question occurred upon 11 death certificates received during 1923 in England and Wales. In one of these cases (a child aged 1 month) it was ascertained upon inquiry that the vaccination had no connexion with the death, which was accordingly classified to the certified cause of heat-stroke. The remaining 10 cases, together with two others in which the words did not occur upon the certificate but which were ascertained upon inquiry to be due to vaccinia, have been classified as follows :—

Classified to vaccinia.	Classified to other causes in association with vaccinia.	
9 months	3 months	Cellulitis.
19 years	14 years	Septicæmia.
1 month	6 months	Convulsions.
6 years	1 month	Septicæmia.
10 ,,		
6 ,,		
15 ,,		
50 ,,		

Infant Mortality in Market Drayton.

Sir CHARLES OMAN asked the Minister of Health whether he was aware that Market Drayton had the highest rate of infant mortality of all the urban districts of Shropshire, including Shrewsbury, the figures being total urban districts 52 deaths per 1000 births, and Market Drayton 111 deaths per 1000 births, and that this excess of infant mortality had been consistently high since the formation of the urban district ; and whether he would cause some medical member of his staff to make inquiry whether the guardians of this urban district made sufficient provision for necessitous mothers, expectant mothers, and new-born children in the matter of medical aid, provision of milk, and other foods.—Mr. WHEATLEY replied : I am aware that the infant mortality rate in Market Drayton has generally been in excess of the average for the whole of the urban districts in Shropshire, but I would point out that this was not the case in two of the nine years which have elapsed since the formation of the urban district, and that the rate for 1923 was 85 per 1000 births, as compared with 111 in 1922. As regards the last part of the question, the county council is the authority responsible for maternity and child welfare work in this urban district, and I will arrange for an early inspection by one of the medical officers of the department, when inquiry will be made.

THURSDAY, JULY 17TH.

Tuberculosis Officers and Attributability.

Mr. ROBERT MORRISON asked the Minister of Pensions for what reason tuberculosis officers were prevented from expressing an opinion upon whether an ex-Service man's disease was attributable to, or aggravated by, war service ; when this instruction was issued by the Ministry ; and whether it was intended to continue it.—Mr. F. O. ROBERTS replied : The first part of the question does not quite correctly state the position. Tuberculosis officers of local health authorities are concerned with the treatment of tuberculosis and they are not invited to express an opinion as to entitlement in cases which come before them solely for medical treatment. But arrangements have been made for tuberculosis officers to sit as members of medical boards which deal with cases of this disease, and as such it becomes their duty to assist in arriving at the official decision on entitlement which can only reliably be formed when the records of the man's medical history during his service and subsequently are available. The arrangements in connexion with the part to be played by tuberculosis officers in cases of this type were made some 18 months ago. They have, I am glad to say, been found to work well.

Cost of Pensions Ministry Hospitals.

Mr. PHILIP OLIVER asked the Minister of Pensions what was the cost per patient per day of hospitals directly administered by the Ministry ; whether such cost was greater than the average capitation grant given to hospitals administered under the Ministry by voluntary societies ; and, if so, would he, as and when a reduction of bed accommodation became necessary, consider the advisability of closing wards in Ministry hospitals in preference to closing hospitals administered by such societies.—Mr. F. O. ROBERTS replied : The average daily cost to the Ministry per patient in hospitals administered by my department is approximately the same as the cost in hospitals administered for use by my department by voluntary bodies, namely, 8*s.* 8*d.* a day. The Ministry maintain separate institutions only where that course is necessary to supplement otherwise existing accommodation or to provide treatment for special war disabilities (for example, neurasthenia) for which adequate treatment is not otherwise obtainable. In pursuance of that policy the position is reviewed from time to time, and in the selection of accommodation to be relinquished the principal determining factors must be the type of treatment for which accommodation is required and the situation of the various institutions.

Maintenance of Pauper Lunatics.

Mr. CHARLES EDWARDS asked the Minister of Health whether he was aware that the amount of 4*s.* per head repaid to boards of guardians under the 1888 Act for the maintenance of pauper lunatics in asylums was totally inadequate ; and would he take steps to secure that at least half of the actual cost for the maintenance of such patient should be repaid to guardians from national funds.—Mr. GREENWOOD replied : Legislation would be required for the alteration of this grant, and my right hon. friend cannot undertake to introduce such legislation at the present time.

Mentally and Physically Defective Children.

Mr. ACKROYD asked the President of the Board of Education the number of mentally defective and the number of physically defective children for whom grants were being paid to local education authorities, and how these numbers compared with 1914.—Mr. TREVELYAN replied : During the year ended March 31st, 1923, grants were paid to local education authorities in respect of an average attendance of 12,907 mentally defective children and 9793 physically defective children. The Board also paid grants in respect of that year to bodies other than local education authorities for an average attendance of 297 mentally defective children and 1732 physically defective children. Thus they paid grants for a total average attendance of 13,204 mentally defective children and of 11,525 physically defective children. For the year ended March 31st, 1914, the total average attendance of mentally defective children on whom the Board paid grants was 11,307, and on physically defective children 6075.

Danger to Health of Imported Hides, &c.

Mr. TILLETT asked the Home Secretary whether he was aware of the hardships and risks to health and life imposed upon workers handling hides, horns, hoofs, bones, wool, and hair, particularly those imported from India and Asia generally ; and, in view of the fact that docks, wharves, quays, warehouses, and workshops at which these commodities were handled for transporting and sorting were not scheduled under the Factory Acts, would he take steps to include in the forthcoming legislation such clauses as would cover all those engaged in the handling of these commodities.—Mr. HENDERSON replied : I am well aware of the risk from anthrax to which these workers are exposed, and will take every possible step to meet it. There is already power under the Factory Acts to make regulations for the protection of persons employed in docks and the other premises mentioned, and regulations are in force in regard to the handling of hides imported from Asia or Africa. Experience shows, however, that the most, if not the only, effective remedy consists in the disinfection of the material, and the most hopeful line of advance, therefore, will be to utilise, wherever practicable, the powers conferred by the Anthrax Prevention Act, 1919, by providing for compulsory disinfection at the port of entry. As my hon. friend knows, certain materials are already being compulsorily disinfected at the Government station at Liverpool, and the extension of this requirement to other materials, and in particular to East India wool, is now under consideration.

Silicosis among Miners.

Mr. FREDERICK GOULD asked the Home Secretary if he could now give further information as to the reported cases of silicosis among miners ; and whether any progress had been made with a view to schedule the same as an industrial disease under the Workmen's Compensation Act.—Mr. HENDERSON replied : As the hon. Member will be aware, the reported occurrence of silicosis among coal-miners, due to their work in the mines, has been the subject of inquiry by the Health Advisory Committee of the Mines Department, but I am informed by the Mines Department that the evidence so far received has proved to be untrustworthy. The investigation is, however, being continued.

FRIDAY, JULY 18TH.

Wireless at St. Bartholomew's Hospital.

Mr. WALTER BAKER asked the Minister of Health how many institutions under his control had been equipped with wireless receiving sets: and whether, having regard to the success of the installation at St. Bartholomew's Hospital, he would look favourably on any proposal to install such apparatus.—Mr. WHEATLEY replied: I have no information as to the number of institutions in which wireless sets have been installed. I am advised that if such an installation is desirable for the well-being of the inmates of the institution it would be competent to the authority to incur reasonable expenditure for the purpose.

MONDAY, JULY 21ST.

Vaccination in India.

Mr. CLARKE asked the Under Secretary of State for India if his attention had been called to the imprisonment of parents in Hyderabad, Sindh, who had conscientious objections to vaccination: and, if so, if it was the intention of the Government of India to amend the Vaccination Act so as to assimilate the law to that prevailing in this country.—Mr. RICHARDS replied: The answer to the first part of the question is in the negative. I am not aware that the Government of India contemplate an amendment of the Vaccination Act.

Anthrax Contagion in Indian Wool.

Mr. TILLETT asked the Under Secretary of State for India the conditions of labour enforced in India upon workers handling, sorting, and transporting hides, horns, hoofs, bones, wool, and hair, and what regulations were imposed to prevent the contagion of anthrax from reaching such commodities; and could he indicate the hours of employment and system of labour operating amongst those engaged in handling these commodities.—Mr. RICHARDS replied: Workers in India employed in factories, including wool mills, are subject to the provisions of the Factories Act, a copy of which I shall be happy to supply to my hon. friend. A provision was added to the Act in 1922 enabling the Governor-General in Council to make rules for the disinfection of wool used in factories which may be infected with anthrax spores. So far as I am aware no rules have been framed, probably because anthrax is an exceedingly rare industrial disease in India.

Indian Medical Department Allowances.

Mr. HOPE SIMPSON asked the Under Secretary of State for India whether, seeing that during the war officials of the Indian Medical Department drew separation and other kindred allowances and that under Royal Warrant, A.O. 357 dated August 28th, 1920, marriage allowance was substituted for those allowances, whether members of the Indian Medical Department now drew marriage allowance; and, if not, for what reason that allowance was withheld from them.—Mr. RICHARDS replied: Marriage allowance was granted in India to personnel of the British Service and to certain other ranks drawn from the British Service and serving under the same general conditions of pay. It was not considered necessary to extend the allowance to the Indian Medical Department, the personnel of which, with few exceptions, are domiciled in India. They were allowed to draw separation allowance on account of special war-time conditions.

Death and Sickness in Gold Coast Mines.

Dr. CHAPPLE asked the Secretary of State for the Colonies whether he had yet been able to discuss with the Governor of the Gold Coast Colony the death- and sickness-rate in the mines of that colony: and, if so, whether he was in a position to make any statement.—Mr. THOMAS replied: I have decided to forbid further recruiting for the mines in the Northern Territories of the Gold Coast until conditions are improved. As a first step I arranged a few days ago that Sir William Simpson, a sanitary expert of high authority, should proceed to the colony to investigate and furnish me with a report on the sanitary conditions of the mines and mining villages, and the reasons for the high death-rate among the labourers, and to suggest measures for their improvement. Sir William Simpson is already on his way to the Gold Coast.

Visits to Lunatics in Asylums.

Sir JOHN MARRIOTT asked the Minister of Health whether the parents of a patient detained in a lunatic asylum were, by regulation, denied access to, or communication with, the patient if the wife of the patient raised objection to such communication.—Mr. WHEATLEY replied: I am not aware of any such regulation. The question of allowing the friends or relatives of a patient to visit or of withholding communications addressed to a patient is entirely within the discretion of the medical superintendent of the mental hospital, who would be guided in his decision by the patient's condition.

Medical News.

UNIVERSITY OF OXFORD.—The following awards of Theodore Williams scholarships are announced:—Human Anatomy (£50 for two years): Denis Hubert Brinton, New College. Physiology (£50 for two years): George Eric Macdonald, New College. Pathology (£60 for two years): Thomas Cecil Hunt, B.A., Magdalen College.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful:—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part I., Physics and Electrotechnics.—John Lavelle, Walter M. Levitt, Frewen Moor, Cusach J. K. O'Malley, James R. K. Paterson, John V. Sparks, and Maurice Weinbren.

Part II., Radiology and Electrology.—Arthur R. Colyer, Charles R. Enticknap, Alexander C. Fowler, Shanazar G. Galstaun, Pratap S. Khosla, John Lavelle, Walter M. Levitt, Alexander G. MacLeod, Thomas D. Overend, James R. K. Paterson, Gordon D. Thomson, Kenneth F. Vickery, John Wall, and Barbara G. Wood.

UNIVERSITY OF MANCHESTER.—As a result of the recent examination, the following obtained certificates in school hygiene, subject to confirmation by the Senate: Enid F. Stowell, M.B., Ch.B., D.P.H., and Ethel White, M.B., Ch.B., D.P.H.

The Sidney Renshaw Prize in Physiology has been awarded to W. H. Newton, and the University Prize in Medicine to Robert Newton. Gold medals were awarded on dissertations for degree of M.D. to K. V. Bailey and F. R. Ferguson. The Sheridan Delépine Fellowship in Preventive Medicine was awarded to L. P. Lockhart.

UNIVERSITY OF LIVERPOOL.—As the result of the recent examinations in the Faculty of Medicine, the following are the names of the successful candidates:—

DEGREE OF M.D.

H. Cohen, M. J. Cohen, and B. L. McFarland.

DEGREE OF PH.D.

T. Southwell.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class II.—*C. B. Bamford, †Helen S. H. Brown, †A. Pool, *E. Scott, and †Gwennie Williams.

* Distinction in Medicine. † Distinction in Obstetrics.

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part III.—Mary G. B. Allen, R. V. Berrington, C. H. Bradley, J. S. Bradshaw, R. S. Brock, Alison M. Brummitt, A. Cooke, J. W. Cowen, J. D. Craig, M. M. Datnow, Edwina M. Davies, L. Davies, R. Y. Dawbarn, Eileen M. Deane, W. T. Donovan, H. Duff, J. B. Elleray, H. W. Fell, H. R. Fisher, F. F. Fuller, G. A. Garrett, Susan Gluck, T. A. Griffiths, D. C. G. Hanlon, T. Hare, Fannie S. Holt, G. P. Huws, L. E. Johnson, R. W. Jones, R. Jones, A. L. Kerr, D. Kippax, J. Leggate, W. E. Lishman, J. H. M. Little, G. Lowe, G. Macdonald, Margaret S. Macdonald, Phyllis Marsh, G. A. Moulden, A. Newton, R. J. Prydderch, Gwendolin H. ff. Roberts, E. Rowlands, J. A. Scott, G. V. L. Taylor, Marjorie A. Unsworth, Mabel J. Watterson, N. Weinberg, and H. S. Welton.

Part II.—R. M. Ainsworth, H. W. Altschul, A. T. Ashcroft, Ethel Barrow, E. I. Bieber, ‡C. A. Birch, H. M. Boston, B. H. Brickman, W. G. Brookes, N. L. Corkill, R. F. Corlett, D. E. Davies, P. V. Dillon, J. L. Donnelly, ‡L. Earlam, J. C. Edwards, Sybil O. Edwards, ‡C. J. S. Garton, M. Goldberg, Dorothy A. Gough, Frances M. Greenhalgh, R. I. Greenshields, Gwyneth Griffith, C. A. Harris, ‡J. Hatton, Beryl M. Hawthorn, J. C. Heal, R. E. Horsfall, E. Hughes, ‡F. Hughes, S. M. Katz, C. Kaufman, B. Kay, J. E. S. Lloyd, W. J. Lloyd, ‡L. J. A. Loewenthal, T. R. E. Longton, H. McGrath, ‡G. McNichol, K. N. Mawson, J. W. Melville, F. Murgatroyd, E. L. Murphy, Winifred A. Nicholson, H. E. Pearson, H. Peaston, J. W. Reid, §Miriam Roskin, J. C. Ross, Ruth Simpson, N. P. Slade, I. Thomas, Margaret E. Thomas, E. F. Thompson, C. E. Unsworth, J. Unsworth, Rosalind Vacher, J. E. Walker, and F. W. Yates.

Part I.—R. M. Ainsworth, M. A. E. Azzam, H. E. Barrow, C. Baxter, B. H. Brickman, A. S. S. Brown, D. Cohen, J. Katz, Alice M. Luck, J. W. Melville, E. L. Murphy, Irene M. Neal, J. J. O'Donovan, Mary T. Penrice, W. J. Pierce, Mary A. Silcock, and W. L. Webb.

‡ Distinction in Forensic Medicine and Toxicology.

§ Distinction in Public Health.

DIPLOMA IN PUBLIC HEALTH.

W. J. Birchall, R. W. Brookfield, B. L. Chopra, H. M. Cohen, F. S. Fowweather, E. S. Gawne, Annie R. Niven, C. J. de V. Shortt, and J. F. D. Shrewsbury.

UNIVERSITY OF LEEDS.—At a congregation of the University held on July 5th degrees were conferred by the Chancellor, the Duke of Devonshire. Among these were the following Degrees in Medicine:—

Ch.M.—Digby Chamberlain.

M.B., Ch.B. (Second-class Honours).—Thomas H. B. Bedford, Andrew M. Claye, Harry Edelstein, Harry Ross, and Joseph G. Ward.

Ordinary.—William C. Abell, Herbert Bruce, Alexander Cannon, Joseph Cardis, Aileen N. Claye, Frederick Clegg, Maria L. Gaunt, George D. Gordon, Muriel D. Graham, Miles Hutchinson, John W. Pickard, Kathleen M. Potter, Leslie N. Pyrah, Norman A. Rymer, Norris A. Scadding, Geoffrey H. Sellers, John E. A. Simpson, George R. Sunley, Donald M. Sutherland, Harry Taylor, Wilfred Thistlethwaite, Edward W. Vincent, Hester E. Woodcock, and Donald Yates.

Memorial Service to the late Sir Sydney Russell-Wells.—A service in memory of the late Sir Sydney Russell-Wells was held on July 22nd in St. Margaret's Church, Westminster, where members of his family and a large number of his private friends were present, as well as many representatives of public bodies with which he was connected.

Addenbrooke's Hospital, Cambridge.—A post-graduate course will be held from Sept. 30th to Oct. 3rd inclusive. The course will consist chiefly of demonstrations of medical and surgical cases and of pathological specimens; also of advances in clinical pathology and biochemistry likely to be of interest to general practitioners. There will be no fee. A syllabus will be supplied later on application to the hon. secretary, Dr. Aldren Wright, at the hospital.

Tropical Disease Prevention Association.—Dr. Louis W. Sambon has left for Iceland under the auspices of this Association to continue there the epidemiological researches as to the causation of cancer which he began last year in Italy. It is proposed to extend his mission later to the West Indies, where he would carry on investigations on the same lines and establish comparisons between the factors of environment, climate, and natural history as bearing upon the incidence and causation of this disease.

Association of Certificated Blind Masseurs.—The sixth annual general meeting of this Association was held on July 17th in the Armitage Hall of the National Institute for the Blind (by kind permission of the authorities). The meeting was presided over by Sir Robert Jones, and the chair was taken by Mr. Michael Whitfield, B.A., who is himself a blind masseur. Sir Robert Jones spoke of the excellent work done by members of the Association, and expressed the desire that the Association would extend its sphere of usefulness over an even greater area.

Medical Congress and Exhibition at Seville—The acting British Consul at Seville has forwarded to the Department of Overseas Trade a copy of the programme of the Second National Congress of Medicine to be held at Seville from Oct. 15th to Nov. 5th next, and a copy of the regulations for the Medical and Hygienic Exhibition to be held during the Congress. The Exhibition is open to exhibitors of all nationalities, but the Congress is limited to medical men authorised to practise in Spain, Portugal, and South America. The programme of the Congress (in Spanish) and a translation of the regulations for the Exhibition may be consulted at the Department of Overseas Trade (Room 53), 35, Old Queen-street, Westminster, London, S.W. 1.

Medical Hydrology at Cheltenham.—At Cheltenham on July 12th and 13th, hospitality was provided by the local medical men to medical guests. Visits of inspection were paid to the Pump Room and Medical Baths, the Pittville Spa establishment and the hospital, and motor drives were taken to Cleeve Hill and other resorts. Dr. Fortescue Fox, on behalf of the Committee for the Study of Hydrology in Great Britain, delivered an address and described the policy of the Committee as two-fold: (1) to establish permanent recognised instruction in medical hydrology in the medical schools of this country; and (2) to obtain for the British spas the recognition and assistance to which they were entitled from the Government. Great progress, he said, had been made in the first of these aims, and lectures were now being given in medical schools in London and in several provincial universities; while visits of medical men and medical students to the various spas were being organised. In addressing the student visitors, Dr. Fox explained the particular properties of Cheltenham as a spa. The action of the Cheltenham climate and baths upon invalids was sedative or calming, and not, as at most of the British spas, tonic or exciting. The waters of Cheltenham were first of all eliminative, and there was a great variety of toxic or poisonous conditions to which they were applicable, but it must never be forgotten that external treatment was an essential part of hydrological work. Short lectures and practical demonstrations were then given by Dr. A. G. F. Forster on radiant heat, Dr. S. M. Hebblethwaite on the Vichy douche, and Dr. J. R. Collins on the paraffin, contrast, and whirlpool baths. Dr. R. Kirkland read a paper on the use of the waters, and cases from the hospital were shown by Dr. H. F. Powell.

The board of management of the London School of Hygiene and Tropical Medicine have appointed Mr. R. W. Harris, formerly an assistant secretary at the Ministry of Health, to be the secretary of the school.

General Medical Council and the Irish Free State.—On July 16th the Government of the Irish Free State introduced a Bill on Dail Eareann to authorise the General Medical Council to continue to exercise jurisdiction and authority under the Medical Acts in respect of medical practitioners in the State for the period of one year.

The first number of the *Cripples Journal*, a shilling quarterly concerned with the progress of medical and social work in the care and cure of cripple children here and abroad, will be published to-day, July 26th, by the Shropshire Orthopædic Hospital, Oswestry. Among its contributors are Sir Robert Jones, Sister A. G. Hunt, and Dr. McCrae Aitken.

North Persian Forces Memorial Medal.—Wing Commander Harold E. Whittingham, Royal Air Force Medical Service, has been awarded the North Persian Forces Memorial Medal for the year 1923 for a paper on Observations on the Life-history and Bionomics of *Phlebotomus papatasii*, written in conjunction with Flight Lieut. A. F. Rook, R.A.F. Medical Service. This is the first award of the medal, which, in accordance with the terms of the Trust Deed of the Memorial Fund, is awarded annually for the best paper on tropical medicine or hygiene published in any journal during the preceding 12 months by any medical officer of under 12 years' service of the Royal Navy, Royal Army Medical Corps, Royal Air Force, Indian Medical Service, or of the Colonial Medical Service, provided the Memorial Committee consider the papers published have attained a standard of merit justifying an award.

Royal Medical Benevolent Fund.—At the last meeting of the committee 30 cases were considered and £508 10*s*. voted to 29 applicants. The following is a summary of some of the cases relieved:—

Widow, aged 64, of L.F.P.S. Glasg., 1896, who practised in Waterloo-road, London, and died September, 1902. On the death of her husband applicant was left unprovided for with the exception of a little help from her daughter. The daughter married and her husband died, and left her with a child now aged 7. The daughter took a post as waitress in a city café—unfortunately, she died in March of this year. The mother is now left without means and this little girl. Customers at the café collected £40, and a customer who has taken an interest in the case is allowing £1 a week at present. Voted £26.

Daughter, aged 64, of M.R.C.S. Eng., 1869, who practised in London and S. Africa and died in 1869. The family managed to live comfortably until the war. Most of their funds were invested in Russia and have all been lost. Since then the applicant, whose health is not good, has earned an average of about £14 a year by needlework. She receives from investments £25, and from a private charity £25, and a friend who can scarcely afford it £20. She lives at a ladies' home at Hampstead, and pays £56 a year. Would greatly appreciate a little help as she finds it difficult to pay her way. Voted £18 in 12 instalments.

Widow, aged 47, of L.S.A. Lond. who practised at Bristol and died in April, 1924. There are two children—daughter, aged 18, at school, and boy, aged 16, at school, who was at Clifton College. The applicant is arranging to sell the house she now resides in and to take a smaller one. Expects when all her affairs are settled to have about £500 left. Proposes to take one or two paying guests. Present rent £75 a year. Voted £10.

Widow, aged 48, of M.B. Aberd., 1895, who practised in Scotland and served in R.A.M.C. (T.) and in the Royal Air Force. Suffered from cancer and died in London Hospital, May 7th, 1924. During his illness help was given by the Officers Association and other funds. These have now stopped. Widow and family living in a furnished house at £8 8*s*. per month. Eight children, ages 10 years to 25. The eldest son is a medical student. It is likely to be three months before the question of pension is settled, and in the meantime the widow is without means and asks for some immediate help to provide home expenses. Voted £20.

Widow, aged 39, of L.R.C.P. & S. Edin. who practised at Liverpool and died September, 1923. *Prior to his death husband* went to S. Africa and took his typist with him, and left her all his belongings. The applicant was left with a daughter now aged 15, who is being educated at a convent in France in return for giving music and English lessons. Applicant has endeavoured to make a living as a musical comedy actress and earned £30 during the early part of the year, but has contracted severe eczema in the ankles which has stopped this. Mrs. Fuller has interviewed her and prepared a report. Lives with a sister and contributes towards the rent. Voted £20 in two instalments.

Widow, aged 30, of L.R.C.P. & S. Edin., 1888, who practised at Stockton-on-Tees and died June 24th, 1924. Her husband, who was a Territorial, joined up for the war and served mainly in the East. He contracted severe heart disease and died after a long illness. Applicant's savings were practically exhausted in looking after her husband, and she is now practically without funds. Has a boy aged 6 Applicant could take a post if arrangements could be made for the boy to be looked after. The Fund gave £26 to the husband just before he died. Voted £20.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, K.B.E., M.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 12TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 57; scarlet fever, 1413; diphtheria, 654 (as against 619 of the previous week); enteric fever, 126; pneumonia, 497 (as against 657 of the previous week); puerperal fever, 32; cerebro-spinal fever, 6; acute poliomyelitis, 22 (as against 12 of the previous week); acute polio-encephalitis, 4; encephalitis lethargica, 81 (as against 103 of the previous week); continued fever, 1; dysentery, 5; ophthalmia neonatorum, 121. There were no cases of cholera, plague, or typhus fever notified during the week. Of the 57 cases of small-pox, 25 were notified from the county of Derby (Derby 6, Chesterfield 14, Chesterfield R.D. 5); 9 from the county of Nottingham (Nottingham 6); 2 from the county of Warwick (Coventry); 11 from Yorks, N. Riding (Middlesbrough 10); 7 from Yorks, W. Riding (Rotherham). Of the cases of encephalitis lethargica, 12 were notified from the County of London (Battersea 1, Camberwell 2, Chelsea 1, Finsbury 1, Hackney 2, Holborn 1, St. Pancras 1, Southwark 1, Woolwich 2); 2 from the county of Buckingham (Wycombe); 7 from the county of Durham (Chester-le-Street 2); 8 from the county of Lancaster (Liverpool 2, Manchester 2); 4 from the county of Warwick (Birmingham); 10 from Yorks, W. Riding (Sheffield 5, Gt. Ouseburn 2).

Deaths.—The deaths from diphtheria in the aggregate of the great towns were 24 as compared with 17 of the previous week, and in London 0 as compared to 4 of the previous week.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, July 28th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Addison: Surgical Wards.

TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Burrell: Chest Cases. 11 A.M., Dr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Medical Registrar: Clinical Methods. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY, August 1st.—11 A.M., Dr. McDougal: Electrical Dept. 11 A.M., Mr. Simson: Gynæcological Demonstration. 4 P.M., Dr. Archer: Chemical Pathology.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Dept. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on the Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

GOODWIN, A., M.D. Lond., F.R.C.S. Eng. and Edin., has been appointed Gynæcologist to the Prince of Wales's General Hospital, Tottenham.

WILKIE, D. P. D., M.Ch., M.D. Edin., F.R.C.S. Edin., to the Chair of Surgery in the University of Edinburgh.

General Infirmary, Leeds: MOIR, P. J., M.B., Ch.B. Glasg., F.R.C.S. Eng., Honorary Assistant Surgeon; LEE, HARRY, M.B., B.C. Camb., F.R.C.S. Eng., reappointed Honorary Ophthalmic Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: NOBLE, C. L., M.B., Ch.B. Edin. (Portsoy, Banff); HOWIESON, H. W., M.B., Ch.B. Glasg. (Bo'ness).

Vacancies.

For further information refer to the advertisement columns.

Acton Hospital.—R.M.O. £150.

Bedford County Hospital.—Asst. H.S. £130.

Birmingham City Municipal Bacteriological Laboratory.—Asst. Bacteriologist and Asst. Venereal Diseases Officer. £600.

Birmingham Cripples' Union Orthopædic Hospital.—H.S. £250.

Birmingham, Rubery Hill and Hollymoor Mental Hospital, Northfield.—Asst. M.O. £350.

Brighton County Borough Sanatorium.—Res. M.O. £350.

Cambridge, Addenbrooke's Hospital.—Cas. O. and Res. Anæsth. £150. Also H.S. £150.

Cardiff City.—Res. Med. Supt. and Asst. M.O.H. £700.

Chesterfield and North Derbyshire Royal Hospital.—Cas. and Orthopædic H.S. £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. £125. Also Radiologist.

Croydon General Hospital.—Jun. H.S. £150.

Derby County Mental Hospital, Mickleover.—Sen. Asst. M.O. £450.

Freemasons Hospital and Nursing Home.—Res. M.O. £250.

Glasgow University.—Chair of Surgery.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—H.S. £175.

Jersey General Hospital and Poor-law Infirmary.—R.M.O. £200.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Lincoln County Hospital.—Jun. H.S. £200.

Liverpool University.—Derby Chair of Anatomy. £800.

London Temperance Hospital.—Cas. O. £150.

Miller General Hospital, Greenwich-road, S.E.—Sen. R.M.O. £250.

Newcastle-upon-Tyne Hospital for Sick Children.—Hon. Asst. S.

Pontypridd Union, Llwynypia Hospital.—Supt. M.O. £700.

Rochdale Infirmary.—M.O. 300 guineas.

Royal Devon and Exeter Hospital.—Asst. P.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.

Sheffield Royal Infirmary.—Med. Reg. £400. Ophth. H.S. £60.

Sherwood Forest, Notts, Ransom Sanatorium.—Asst. R.M.O. £375.

Southampton County Borough.—Asst. M.O.H. £600.

Births, Marriages, and Deaths.

BIRTHS.

BOOBBYER.—On July 19th, at Warwick-road, Ealing, the wife of Dr. P. W. Boobbyer, of a son.

BUXTON.—On July 16th, at Wimpole-street, W., the wife of St. J. D. Buxton, F.R.C.S., of a son.

CANE.—On July 14th, at St. Luke's, Jersey, the wife of Major A. S. Cane, D.S.O., O.B.E., R.A.M.C., of a daughter.

GRIFFITH.—On July 16th, at Roydon, Asheldon-road, Torquay, the wife of Harold Kinder Griffith, F.R.C.S., of a daughter.

WORDLEY.—On July 17th, at St. Mildred's, Plymouth, the wife of Dr. Eric Wordley, of a son.

MARRIAGES.

BAIN—THIRKELL.—On July 19th, at St. Lawrence's Church, Catford, Lawrence Weir Bain, M.D., M.C., to Doris Marion, eldest daughter of Mr. and Mrs. Howard Thirkell, of Catford.

SATOW—NEILSON.—On July 16th, in the Cathedral, Westminster, Lawrence Lancaster Satow, M.C., M.R.C.S., &c., to Margaret de Verchères, younger daughter of Mr. and Mrs. Norman R. Neilson, of Neilsonville, in the province of Quebec, Canada.

DEATHS.

BALLARD.—On July 12th, at Walford House, Smarden, Kent, Richard Pitt Ballard, M.C., M.B., B.S., aged 38 years.

BUTLER.—On July 18th, suddenly, at his residence, Dinton House, Harrow Weald, George Henry Butler, L.R.C.S., L.R.C.P., in his 71st year.

MANTLE.—On July 10th, 1924 (very suddenly), Alfred Mantle, M.D., M.R.C.P., of Archway House, Harrogate.

PIDCOCK.—On July 16th, at a nursing home, George Douglas Pidcock, M.A., M.D., M.R.C.P., &c., of Hampstead, in his 73rd year.

WENYON.—On July 18th, at Lugano, Charles Wenyon, M.D., M.Ch., L.R.C.P., of Fitzjohn-avenue, Barnet, aged 75 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NORTH WALES UNIVERSITY COLLEGE, BANGOR.—On July 17th the honorary degree of LL.D. was conferred by the College on Sir Donald MacAlister "in recognition of his dintinguished services to medical science and as a university administrator."

DONATIONS AND BEQUESTS.—Lord Bearsted has informed Sir Arthur Stanley, treasurer of St. Thomas's Hospital, that he will contribute a sum of £5000 for the funds of the hospital provided that four other persons each contribute a similar amount.—The late Mr. Thomas Edward Dingwall, of Clapton Common, Middlesex, bequeathed to the Royal Northern Hospital, Holloway, £1000 for the purpose of founding a bed to be known as the "Thomas E. Dingwall Bed," "as a token of gratitude for the treatment he received at the hospital in the year 1894."—The Manchester business house of William Sutcliffe, Ltd., manufacturers and warehousemen, have commemorated the golden jubilee of the firm by sending a cheque for 50,000 shillings to the Lord Mayor as a gift to certain Manchester and Salford charities. They have expressed the hope that all firms who pass similar milestones will thus remember the local charities.—The late Miss Elizabeth Sophia Trotter, of Harrogate, besides large bequests to church and other institutions, left £1000 to the Hostel of St. Luke (Nursing Home), London; £2000 to the Royal Bath Hospital, Cornwall-road, Harrogate; £3000 to the Harrogate Infirmary; £500 to the Red Cross Society; £1000 to the Leeds General Infirmary; and £2000 to the Yorkshire Home for Incurables, Harrogate.

Notes, Comments, and Abstracts.

WHY ARE FACTORIES CLOSED TO THE MEDICAL OFFICER OF HEALTH?*

By Lieut.-Colonel F. E. Fremantle, O.B.E., M.P., F.R.C.S., F.R.C.P.

It is strange that so little attention has been paid to industrial hygiene by writers on the public health. The Registrar-General showed half a century ago that, as compared with the mortality of all males, taken as 1000, that of agricultural labourers[1] was only 602, of shopkeepers 973, of doctors 966; while the mortality for painters, plumbers, and glaziers was 1120, and that of men in iron and steel manufacture was 1301, of potters 1706, and that of unoccupied males 2215. Here, surely, was a key to the cause of much preventable sickness, inefficiency, and mortality. And yet the subject received little notice in the text-books or in the lectures and examinations for the Diploma in Public Health, until the Factory and Workshop Act, 1901, threw sanitary responsibilities for the workshops on the sanitary authorities. And then only in respect of certain limited functions. Sir John Simon's classic on English Sanitary Institutions makes no allusion to the supervision of health in factories; nor do Mr. and Mrs. Sidney Webb, in their handy book on "The State and the Doctor"; and I have searched my library in vain for any description of the Chief Inspectors' department and methods.

The reason is clear. Public health and its diplomas have been built up by the Privy Council, and the late Local Government Board, and by local authorities and their medical officers, pioneered by the army and the army surgeons in the Crimea under the acid test of war. They have been directed to the needs of the medical officer of health in this country; they have been limited by the experience and training of the only teachers available, with few exceptions medical officers of health, or inspectors under the Local Government Board. It is almost by chance, and only after great delay, that the "principles and practice of hygiene" are being extended to their proper scope, including the physiological and psychological conditions of the individual, the need of early correction of defects, the need of pure, rather than ad hoc research, the supervision of health in every walk of life from the cradle to the grave, under whatever Government department; and not least, the adaptation of individual and communal life to other climates and other racial, social, industrial, and parasitic surroundings. The forthcoming establishment of the London School of Hygiene and Tropical Medicine, due to the generous benefaction of the Rockefeller Trustees, and the wise coöperation of our Government, will be based on these broader lines.

[Colonel Fremantle then outlined the history of industrial hygiene, which, he said, was mainly confined to that of factory supervision by the Home Office. He traced this history from the Factory Reform Bill of 1802, the Factory Act of 1833, and the first appointment of certifying surgeons in 1844, up to modern times, when the dual control of the local authorities who employ medical officers of health and the Home Office, under which department the inspectors of factories and certifying factory surgeons work, leads to lack of coördination in many respects. He continued:—]

The Disadvantages of Dual Control.

One of the foremost and wisest of medical officers of health gives me privately his experience of the dual position in one of the big industrial cities: "I have felt strongly on this subject for a great many years. My own feeling is that the Home Office has not made their factory and workshop inspection a health service. They have a lot of very competent engineers and chemists, but they ought to have far more competent medical investigators and, I think, a medical chief. As you know, there is a duplicate control partly by the Home Office and partly by the local authority, and as a result, I am very sorry for the manufacturer, who frequently has an inspector from the Home Office and one from the local authority in the works on the same day and at the same time. The local authority's control of factories is almost a negligible one, dealing as it does with sanitary accommodation. In regard to workshops, our control, of course, is very much larger, but in recent years the Home Office has appointed so many workshop inspectors who go over all the work supposed to be done by the local authority, that it is a real hardship on the occupier of the workshop at times. great many lay inspectors recognise that they have to fi something to talk about, and suggest at every visit, so th the workshop owner never knows when he has done. Perso ally, I am not greatly concerned as to who should do the things, so long as they are done. If the local authority is take it in hand, then it ought to be a real workshop or facto service, and they must be given the control and responsibili necessary and must not be interfered with. At the prese time I believe that local authorities do very little, becau they are always up against something that the facto inspector has done or suggested. It is quite true that medical officer of health, I am supposed to have power investigate anything in the district. If I tried to find o what it was that was damaging the health of a set of worke in a particular factory I might be told to mind my own bu ness, and that it was the function of the factory inspect Consequently, the work is left unless, of course, it is a ve serious matter, and then one would report it direct to t factory inspector for investigation. I have said all this, b I do not want you to think that there is any friction betwe the Home Office inspectors and myself. They have alwa been most courteous and willing to help, and we could n have a nicer lot of men than those who are here just now.'

The Factories Bill.

[Colonel Fremantle criticised the findings of the depar mental committee on medical examination of young perso for factory employment, appointed this year by the Hon Secretary, in so far as its proposals (Cmd. 2135) we framed on the basis of the present administration. continued:]

The Factories Bill was subsequently introduced on Ma 22nd. It is a great consolidating and amending measu of 143 clauses and 100 pages, prepared under the la Unionist Government. The mere titles of the parts of t Bill indicate that the factory code and its administratio are essentially devoted to the health and physical welfa of the people: I. Health; II. Safety; III. Welfare—viz drinking-water, washing facilities, first-aid, facilities f sitting, keeping and drying clothes, protective clothin welfare orders, weekly rest-day; IV. Health, Safety an Welfare (Special Provisions); V. Accidents and Industri Diseases; VI. Employment of Women, Young Persons, an Children; VII. Special Applications and Extensions VIII. Home-work; IX. Piece-work and Wages; X.-XI Administrative, Legal and Definitive.

There could be no doubt to a judicial referee that thes matters are essentially part—and a very large and essenti part—of the science of public health. And the furthe limitations and standards to be imposed are, from th standpoint of those concerned for the national health, a to the good. The Factory Department, indeed, of the Hom Office, is a second Ministry of Health; or rather, since th Board of Education is a second, this is a third Ministry o Health. Nor does the present Bill seek materially to chang the position. It certainly invokes the assistance of the loca education and sanitary authorities at the will of the Hom Secretary. But it actually deprives the local sanitar authorities of their present responsibility for the sanitatio of workshops. The term factory is to include workshops an workplaces, and so the Home Secretary is responsible fo the whole administration of the Act, and the gradual devolu tion of powers to the local authorities, instituted in 1901, i left to his discretion to rescind or to develop as he, in hi successive incarnations, may think fit. Instead of th "certifying surgeon" we are to have the "appointe doctor" throughout, and his appointment and remuneratio is entirely in the Home Secretary's hands. He may, of course be the local school medical officer or medical officer of health but he seldom will be so, except where the Home Secretar delegates his powers in any area to one local authority o another. At the will of the Home Office, then, the medica officer of health may be more generally barred from th workshops than ever.

Defects of the Present System.

Who is the Inspector? Who is he, indeed, to whom in actual practice the whole health of the nation in its industrial life is committed? Is he medically trained? In a few cases only. Is he trained as a sanitary inspector? Or is he an engineer, trained only to look on accidents as due to bad machinery or preventable negligence? With few exceptions, one cannot believe his attitude of mind is as helpful to the main purpose of factory legislation as the medical officer of health, school medical officer, or sanitary inspector.

And he works from Whitehall or at least from a centre covering a large area, and the supervision of certain special industries—as of certain diseases—over a large area is obviously essential. But what can he know intimately of the personnel in the factory, employer, management or employed, and of the ways in which they interpret the regulations? Would it not be of value to bring the local authorities and their trained officials generally into the system?

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* Abstracted from a paper read to the Section of Industrial Hygiene at the Congress of the Royal Sanitary Institute, held in Liverpool, July 14th to 19th, 1924.

[1] Figures revised for England and Wales, 1890–2.

How can the lay inspector decide when re-examination of a young person by a doctor is required? Yet under Clause 92 of the new Act, the whole responsibility continues to rest with him. And over and over again time alone can show if a young person is fit for the particular industry for which he has been passed by the appointed doctor; the proof of the pudding is in the eating.

And how is liaison established with the school medical officer, where the Home Secretary has not delegated his powers to the local authority; with the tuberculosis officer with infectious disease in the area; with home conditions? No, at present the medical officer of health and the whole health system of the country are barred from the factories and workshops. And the reason of their being barred is that the Factory Code has grown up in a separate groove, and employers feel safer in this groove, and no Government has the enterprise to establish a comprehensive system of health promotion in this country, as intended in the creation of the Ministry of Health.

Moreover, as one of the most distinguished and experienced authorities of the day expresses it: "Factory administration is the great example of centralised Government without any corresponding local Public Health administration, except in minor matters. On some points it would be easy to indict it; on others it has been a valuable safeguard against local inertia or corruption, and it has enabled large views sometimes to be taken."

The Alternative.

It will be recognised that under the new Bill the Home Secretary has power to make valuable experiments in devolving certain powers to local authorities. But it would surely be of value if he could further devolve all his powers under the Bill to certain county borough councils, willing and able to undertake them, under the central supervision of the experienced inspectors of the Home Office, comparable to the control of local authorities by the Ministry of Health and Board of Education. This would be a useful and, I believe, a safe experiment, which would work well in the interest of employers and employed, and would benefit considerably the health of the general community. Further devolution might follow in course of time to the councils of counties, of boroughs, and of the larger urban districts. But until county councils are given supervising powers in connexion with health, this devolution must be incomplete. For the councils of the smaller districts would not for the most part be capable of undertaking the responsibility and giving the constructive help required. The district medical officer of health and sanitary inspector must, it would seem, continue to be barred from the factories, unless, and until, the system of local government is overhauled, as I hope it may be before long, and a proper county system evolved with suitable allocation of interests, supervision and organic coöperation between the county and its constituent districts. By then it is to be hoped that future medical officers of health and sanitary inspectors will be taught more of industrial hygiene than we were 30 years ago.

As to the Ministries, it would be impossible to transfer the Factory Department of the Home Office to the Ministry of Health, unless the latter were to be relieved of some of its work, not connected with health, such as local government control. It has also been suggested that housing should be transferred to the Board of Works. But these transfers cannot be lightly undertaken. Nor is piecemeal reorganisation of the departments sound. In the interests of the national health we must consider the universal grip that health considerations must have on every section of governmental responsibility. In this view it seems clear that the general conclusion of Lord Haldane's Committee on the Machinery of Government holds good. Every ministry must, for instance, have its department of finances; and most must have a department of health and welfare. The analogy of the army again is useful; for the Army Medical Service not only has complete control of the Royal Army Medical Corps, but also has technical control of the medical and sanitary personnel, to whatever formation, regiment, battery, army corps, or depôt it may be attached; and the Director-General, Army Medical Service, is responsible for advising and therefore collecting all information as to the health of any unit or man in the army. But the commanding officer of each unit or formation is primarily responsible for the health of the men under him, and for the immediate command of medical and sanitary personnel attached.

So, it seems clear, must the health services of civil government be gradually developed. I would see all medical and sanitary personnel recruited and controlled throughout their career and allotted to the several services of the Government departments by the Ministry of Health, to whom they should be technically responsible. But each Government department should have its own health section, as it has its own section of finance, an integral part of that Ministry with direct access to the Ministers, and the Minister in charge would be held responsible for the application of services in such a way as to assist him in the discharge of his responsibilities in connexion with health. The collateral, technical chain of relation between the personnel and the Minister of Health would bring that Minister and his department into intimate relation with the whole activities of national life and would make him in fact, what hitherto he has been partially in fact, but largely only in name, the head and centre of a complete system of national health.

Anyone daring to suggest that this system is complicated, unpractical, should be referred to the army, where a similar, clear, and definite division of responsibility proved of infinite value under the acid test of the late war. It is the only solution.

PUBLIC HEALTH IN BIHAR AND ORISSA.

IN THE LANCET of July 12th (p. 100) we dealt with certain portions of the last official Public Health Report from Patna, but other aspects of the conditions in Bihar and Orissa deserve notice.

The "Special Epidemic Reserve."

A "Special Epidemic Reserve" of 100 vaccinators was entertained from April to September for cholera and other epidemic duty, the work done (disinfection, treatment of wells, and the use of simple remedies) being very satisfactory and much appreciated. A cholera survey of the local conditions in four *thanas* of Cuttack district, where there was undue prevalence of the disease, was also started. Small-pox caused 2560 deaths, showing a mortality of 0·07 per 1000, compared with 0·2 in the previous year and 0·3 in the quinquennium. No district returned a higher ratio than 0·2 (in Purnea and in Singbhum), and in Angul there was not a single fatal case. "Vaccination is neither compulsory nor free. . . . It would, therefore, appear to be wise and proper to organise the work more effectively, and to make vaccination compulsory and free, in order to get the whole population protected, and thus abolish a disease which is of all diseases the most easily and cheaply preventable." As to the justice of this opinion there can be no doubt. There was a general fall in the mortality from "fevers" (17·0 deaths per 1000, compared with 22·6 in 1921 and 23·4 in the decennium). In Puri district of Orissa division (bordering on the Bay of Bengal) the lowest ratio was recorded (8·6); in Angul district of the same division (but inland) the ratio was 19·6; and in Palamau (Chota Nagpur) 22·1. Colonel Ross does not consider "that it is practicable to prevent malaria, or to reduce it permanently, or on any large scale, by the use of quinine"; he believes that "the adoption of non-productive anti-malarial operations, such as draining, levelling, filling hollows and oiling water surfaces is also not a feasible means of prevention on a large scale over an enormous area. . . . It is therefore, in my opinion, a waste of time to discuss and advocate the use of such measures, except in special cases. . . . What is wanted is a policy of malarial prevention, which will pay its own way. . . . Such a policy is possible; it is already being carried out in Italy and in Spain. It consists in combining agricultural improvement with sanitation, by draining or flooding marshes and wet lands in a scientific manner, so as to produce larger crops, and at the same time to reduce the breeding of transmitting mosquitoes and the spread of malaria. It improves the health of the people and their prosperity at the same time."

Plague Mortality.

The total deaths from plague numbered 15,066, giving a ratio of 0·4 per 1000, the same as in 1921, but much lower than that of the decennium (1·0 per 1000). Orissa and Chota Nagpur divisions were quite free, also Purnea and Santal Parganas districts in Bhagalpur division. The highest incidences were recorded in Muzaffarpur, Saran, and Darbhanga districts, where the deaths returned were 1·3, 1·5, and 1·6 per 1000 respectively. In the rural areas the ratio was 0·4, Saran, Darbhanga, and Muzaffarpur recording mortalities of 1·6, 1·4, and 1·2 respectively. In the towns the mortality was 1·1 per 1000, the small town of Lalganj in Muzaffarpur district suffering most (17·3), and Darbhanga next (10·5). Colonel Ross considers that "the permanent separation of the rats from the people is the only permanent measure of prevention." This makes it an "economic question," which for this province means agricultural improvement.

Dysentery and diarrhœa caused 18,037 deaths, giving a ratio of 0·5 per 1000, as compared with 0·9, the decennial average. As usual, these affections were most prevalent in Orissa division, where the mortality was 2·7 per 1000. The districts of Cuttack and Puri suffered most with death ratios of 3·7 and 3·4 per 1000. In the rural areas of the province the mortality was 0·5, while in the towns it was

0·9 per 1000. Among the former Cuttack and Puri showed the same incidence as for the respective districts *including* the towns—viz., 3·7 and 3·4: No other rural area in the whole province showed an incidence higher than 0·9 per 1000, except Sambalpur (2·1). The report states that "the prevalence of dysentery and diarrhœa in Orissa is probably associated with the climatic conditions, and is to a large extent due to the bad state of the water-supply in many parts of this division" [Orissa]. It might be suggested that climatic conditions have little influence as compared with a bad water-supply, and that the public health authority is undoubtedly responsible for remedying this latter defect. Investigations as to the prevalence of hookworm disease have been carried out in this as well as in other provinces, and show that from 50 to over 70 per cent. of the persons examined were affected. Its prevention "entails both the treatment of infected persons and an alteration in the habits of the people, requiring them to abandon the general practice of relieving themselves in the fields, and to take to the use of latrines," so as to avoid conveyance of infection; "treatment alone is largely a waste of time."

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[1] Patna: Government Press, 1923.

Arris and Gale Lecture

ON

FURTHER RELATIONSHIPS OF
DISEASES OF THE GALL-BLADDER
TO THE SECRETORY FUNCTIONS OF THE STOMACH AND PANCREAS.

Delivered at the Royal College of Surgeons of England on May 2nd, 1924,

BY H. ERNEST GRIFFITHS, M.S. LOND.,
F.R.C.S. ENG.,

HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND; DEMONSTRATOR OF ANATOMY, ST. BARTHOLOMEW'S HOSPITAL MEDICAL SCHOOL; SURGEON TO THE ALBERT DOCK HOSPITAL; ASSISTANT SURGEON TO THE ALL SAINTS' HOSPITAL.

ANATOMY AND PHYSIOLOGY.

IN a Hunterian lecture[1] on this subject delivered last year I endeavoured to explain at some length the various intricate lymphatic and nervous connexions between the gall-bladder, stomach, duodenum, and pancreas. To summarise: The lymphatic vessels of the gall-bladder are conducted downwards along the common bile-duct, and anastomose with those of the first part of the duodenum and the head of the pancreas before terminating in the retro-pancreatic lymph glands. A route of possible infection is thus readily demonstrated between the gall-bladder, duodenum, and pancreas.

The vagus is the motor and secretory nerve to the gall-bladder and bile passages, and is inhibitory to the sphincter of the ampulla of Vater. The sympathetic, deriving its fibres from the ninth right intercostal segment, is the sensory nerve to the gall-bladder and ducts, and is inhibitory to the muscular wall but supplies the motor filaments to Oddi's sphincter. Thus stimulation of the vagus causes emptying of the gall-bladder through a relaxed sphincter, and stimulation of the sympathetic causes closure of the sphincter and filling of the lax-walled gall-bladder with bile. The vagus in the stomach is again the motor and secretory nerve, and is inhibitory to the pyloric sphincter. The sympathetic derived from the fifth, sixth, seventh, eighth, and ninth thoracic segments is inhibitory to the muscle in general, but motor to the pyloric sphincter. The ninth intercostal segment is mainly responsible for the contraction of the pylorus. The pancreas derives its nerve-supply from both sympathetic and vagus. Stimulation of the vagus causes profuse thin secretion from the pancreas, whereas stimulation of the sympathetic is followed by a small but thick secretion. The sympathetic filaments of the pancreas are mainly derived from the ninth thoracic segment of the cord. With the close developmental origin and nervous association of the gall-bladder, pancreas, pylorus, and first and second parts of the duodenum it must be expected that in their physiological actions and pathological reactions they are closely allied.

Clinically, this is perhaps best exemplified by pylorospasm. Irritation of the mucous membrane of the gall-bladder causes a reflex irritability of the vagus which is most marked by its action in the stomach, where an increase in the amount and acidity of the gastric juice is produced, associated with relaxation of the pylorus and regurgitation from the duodenum. Whereas, in the majority of cases the vagus reflex is the more marked, in others the sympathetic reflex is more evident. In this type of case the inflammation is generally less chronic. As would be expected, it is shown by increased action of that portion of the sympathetic derived from the ninth thoracic nerve. There is a spasm of the ampulla of Vater and relaxation of the gall-bladder walls with consequent dilatation of the viscus. In the stomach there is a spasm of the pylorus, but as the ninth thoracic segment supplies only the pylorus, there is no sympathetic effect on the remainder of the stomach, and the vagus reflex remains unchecked, causing hyperchlorhydria and contraction of the organ. The first and second parts of the duodenum are dilated and the pancreatic secretion is concentrated but small. This condition is clinically known as pylorospasm, and although in the majority of cases the irritating focus is in the gall-bladder, it may occur anywhere in that portion of the digestive tract where the terminal filaments of the sympathetic derived from the ninth thoracic segment are found—namely, gall-bladder, bile-ducts, pylorus, the first and second parts of the duodenum, and the pancreas.

METHODS OF INVESTIGATING SECRETIONS OF THE STOMACH AND PANCREAS.

In all the experimental work on secretions I have been associated with Dr. Mackenzie Wallis, who has conducted the chemical investigations. It has been found impossible to perform each test on any individual patient; in the first place, the demand for hospital beds is so great that no patient can be kept waiting for operation for sufficient time, and in the second place, one did not feel justified in submitting patients to the discomfort of repeated examinations with the stomach and duodenal tubes.

Analysis of External Secretions.

In the majority of our cases we have analysed the one-hour test-meals. A standard meal of one pint of weak tea without sugar or milk and 2 oz. of toast is given after a 12 hours' fast and the contents of the stomach drawn off through a stomach-tube one hour later. The result is analysed for free HCl, combined HCl, mineral chlorides, and digestive activity. This method has the advantage of simplicity and causes the patient the minimum amount of discomfort.

Fractional Test-meal.—A narrow bore tube is passed into the fasting stomach and the residual secretion is aspirated. With the tube remaining in position the patient is given about a pint of oatmeal gruel. A quarter of an hour later 20 c.cm. of fluid are aspirated for analysis. Further specimens are collected at intervals of a quarter of an hour up to the end of the first hour, and then at half-hourly intervals until two and a half hours after the meal was given. The specimens are analysed for free and combined HCl, mineral chloride, and bile.

Duodenal Tube.—It has been claimed by Meltzer[2] that a solution of magnesium sulphate applied directly to the duodenum causes relaxation of the walls of the gut and of the sphincter muscle of the ampulla of Vater, and almost simultaneously a contraction of the gall-bladder. The flow of bile into the duodenum is thus stimulated. Lyon,[3] basing his experiments on this fact, first described a method of measuring the rate of flow of bile into the duodenum after the injection of magnesium sulphate, and also of segregating the bile, so that the fluid coming from the common bile-duct, gall-bladder, and ducts in the liver might be collected and examined separately. The patient is examined after a 15 hours' fast, the mouth is washed out with a solution of 1/1000 potassium permanganate followed by a weak solution of zinc chloride, and then a sterile duodenal tube passed into the stomach and some of the contents aspirated into a sterile vessel. The stomach is now washed out with sterile water, the patient turned on the right side, and the hips slightly raised by a pillow. The patient is instructed slowly to swallow the tube to the duodenal point, meanwhile drinking a glass of water. It usually takes about 15 to 45 minutes for the tube to pass through the pylorus. This is recognised by the duodenal tug and by the fact that the liquids, such as broth, swallowed by the mouth are not recoverable through the tube. When the duodenum

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[1] THE LANCET, 1923, i., 265.

[2] Amer. Jour. Med. Sci., 1917, cliii., 460.

[3] Jour. Amer. Med. Assoc., 1919, lxxiii., 980.

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considered evidence of deficiency of trypsin. Solomon's test depends upon estimating the amount of lecithin found in the stool after an egg diet. Müller's test for trypsin consists in examination of the stool for ferment after a test-meal. A few drops of the emulsion of the stool are placed on a Petri dish of coagulated blood serum and incubated. The presence of active ferment is shown by the appearance of pits in the coagulum.

Animal Experiments.

Many animal experiments have been devised to show the results of infection of the pancreas in its normal condition, and also when there is interference with its external secretion by ligature of one or both ducts. Truehart found bacteria present in the normal pancreatic duct in 5 out of 223 cases. Experimentally organisms have been introduced into the pancreatic duct directly with a syringe, or the gall-bladder or ducts have been inoculated and the pancreas infected secondarily. Efforts have been made to force infected material into the main pancreatic duct from the duodenum by increasing pressure in the bowel. More success has been obtained in this direction by first causing trauma of the ampulla of Vater, or by passing a thread through the papilla, allowing at least a capillary communication between the duct and the duodenum. Bile and solutions of bile-salts have been injected into the pancreas under different conditions, such as after ligature of one or both pancreatic ducts. Reference to the details and the results of these experiments will be made later.

CORRELATION OF SYMPTOMS.

Alteration in the secretion of the stomach and pancreas is often associated with pain, and in the Hunterian lecture already referred to I endeavoured to make an exhaustive analysis of the types of pain met with in cases of inflammatory lesions of the gall-bladder. Biliary dyspepsia, accompanied as it is by flatulence, is an indication of disordered gastric secretion, and generally denotes hyperacidity. Another symptom of the increase of free HCl commonly associated with gall-stones is referred pain in the left scapular region.

Vomiting of several different types occurs in disorders of the gall-bladder, two of which are definitely associated with disordered secretion of the companion organs. In biliary dyspepsia vomiting may occur after a full meal, but it is not as a rule accompanied by nausea. It is generally small in quantity and of a watery regurgitant type. Occasionally it is copious, resulting in evacuation of the stomach and affording the patient complete relief from pain. Increased gastric acidity is mainly responsible for this type of vomiting. Vomiting that occurs at periodic intervals usually unassociated with any gross disturbance of the gall-bladder and bile-passages, but which may occasionally follow an attack of cholecystitis, is often an indication of pancreatic insufficiency. There is generally nausea present in these cases, but a mild diarrhœa is a constant feature, the stools being fatty and undigested. The attack generally lasts for several days, in more severe cases extending into weeks. Wasting is a constant feature in cases of long duration. The character of the stool, with the marked increase of undigested fat, is symptomatic of pancreatic insufficiency, of which other evidence is given by the increased diastase content of the urine, indicanuria, and sometimes a transient glycosuria. This class of case is due to a catarrhal pancreatitis from invasion of the pancreas with organisms which in the majority of cases appear to be derived from the gall-bladder. During the attack there is definite evidence of diminution of the external, and often of the internal, secretion of the pancreas.

Hyperchlorhydria and Regurgitation.

Working with the one hour test-meal, Dr. Mackenzie Wallis and I have found hyperchlorhydria associated with regurgitation in 99 per cent. of cases of cholecystitis with or without the presence of gall-stones.

A review of the literature of the subject shows that absolutely contradictory results have been obtained by different investigators. Düttman states that irreparable hypoacidity and hypochlorhydria are entailed by inflammation of the biliary passages and they persist in more than 50 per cent. of the patients after operation. The duration of the inflammation and its degree are reflected in the intensity of the secretory deficit in the stomach.[5] Cohn's tables show hypoacidity in the stomach with gall-stone disease in 87 per cent. of 44 cases and in 100 per cent. of 63 cases after removal of the gall-bladder. This constant achlorhydria seemed to be permanent after cholecystectomy. He traced in 11 cases the decline in gastric-juice secretion before operation and after the removal of the gall-bladder. The ferment production he did not find altered.[6] Ohly examined the gastric juice in 200 patients suffering from cholelithiasis. He found that early uncomplicated cases have hypoacidity, while chronic cases present usually subacidity or anacidity. The subjective disturbances localised in the stomach and the amount of mucus present in some patients of the second group seem to indicate an independent chronic gastritis, which might have been the primary affection.[7]

From most of the figures published it will be seen that in the majority of cases of cholelithiasis and cholecystitis the examination of the one-hour test-meal shows a deficiency in free acid. This may be due to two causes; first, there may have been less hydrochloric acid secreted by the stomach—a true hypochlorhydria—which may even have amounted to achlorhydria; second, the HCl may have been secreted in normal or even greater amounts but have become partially neutralised after secretion. This second cause is probably the real explanation of the apparent hypochlorhydria in gall-stone cases reported so frequently. In typical test-meals the figures are:—

—	Normal.	Hyperc.	Hypoc.	Regurg.
Total chlorides	0·32	0·42	0·25	0·42
Free HCl	0·02	0·02	0·01	0·01
Protein HCl	0·23	0·29	0·18	0·20
Mineral chlorides ..	0·07	0·11	0·06	0·20

Hyperc. = hyperchlorhydria. Hypoc. = hypochlorhydria.
Regurg. = regurgitation.

In a true hypochlorhydria, although the free HCl is diminished in quantity, the mineral chlorides remain about normal, and in hyperchlorhydria the HCl is increased, but the mineral chlorides are nearly normal. In the last type of case, however, the free HCl is markedly diminished, and there is a corresponding increase in the mineral chlorides suggesting that they were increased at the expense of the free HCl—i.e., that the free acid was first secreted and then neutralised. If this explanation be accepted it would seem that there are three definite types of test-meal results: (1) those showing neutralisation of free acid—regurgitant type, comprising 90 per cent. of our cases; (2) those showing true hyperchlorhydria, 8 per cent. of our cases: (3) those showing true hypochlorhydria, 2 per cent. of our cases. A further examination of type 4 shows that an excess of HCl had been secreted in the majority of cases, showing that there was hyperchlorhydria before neutralisation took place.

It is necessary, then, first to consider why in the majority of cases of gall-bladder disease there is increased secretion of HCl, and second why this acid should be largely neutralised whilst still in the stomach. The causes of the increased acid secretion may be three: First, that it is part of a general decrease in alkalinity of the body tissues, as might be indicated by the increased amount of cholic acid in is reached a few cubic centimetres of air are forced down the tube with a syringe to dilate the duodenum and prevent injury to the mucosa. The contents of the duodenum are aspirated into a sterile bottle. They are greyish in colour, and thick, from the presence of much mucus. Bile is absent from the fasting duodenum. 50 to 100 c.cm. of 25 per cent. solution of magnesium sulphate are next injected through the tube and then very slowly aspirated into a sterile bottle. Within ten minutes the aspirated fluid is seen to be tinged with yellow, which gradually increases until it is of a pale yellow colour. A third sterile collecting bottle is substituted and aspiration continued until, by watching a window in the tube, the fluid is seen suddenly to change in character, becoming darker in colour and thicker in consistency. This, Lyon states, is due to the contraction and evacuation of the gall-bladder, the proceeding bile being derived from the common bile-duct. It amounts to 50 to 100 c.cm. and is collected in a fourth sterile bottle. The bile is not secreted in a constant stream but in a series of little puffs, this being most apparent when the stream of bile in the extra-hepatic ducts is used up.

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[5] G. Düttman: Beiträge zur Klinischen Chirurgie, Tübingen.
[6] G. Cohn, p. 336; Archiv für Klinische Chirurgie, 1923.
[7] A. Ohly: Archiv für Verdauungskrankheiten, September, 1923.

Examination of the Fluid.—In the healthy patient the bile collected through the duodenal tube is free from pus, epithelial cells, and red blood cells. Mucus is present, but in solution. In inflammatory conditions involving the common bile-duct alone—e.g., early catarrhal jaundice—examination of the bile in the third sterile bottle—i.e., bile from the common bile-duct—shows that it is rather thicker than normal and darker in colour; flakes of mucus are plentiful, and examination under the microscope reveals the presence of pus cells and occasionally red blood cells. In pure cases of cholecystitis the bile from the common bile-duct may be normal, but bile from the gall-bladder may be found to be rich in mucus, pus, and columnar epithelial cells; its colour is paler than normal and organisms have been found on culture. In some cases of gall-stones, crystals of cholesterin and bile-salts have been found. In one case described by Lyon several small faceted stones were recovered. There has been considerable discussion as to how the presence of a solution of magnesium sulphate in the duodenum causes a flow of bile. Meltzer's view has already been mentioned—namely, that the salt acts directly on the muscle of the duodenum and reflexly on the muscle of the extra-hepatic bile-passages. It has been claimed that osmosis is responsible for the attraction of the bile into the duodenum, and it is shown that certain other neutral salts may be used in place of magnesium sulphate.

In our work Dr. Mackenzie Wallis and I have paid particular attention to the presence of pancreatic juice in the fluid obtained through the duodenal tube. We were particularly fortunate in our observations on one case of Mr. H. J. Waring's. A married woman of 34 had had intermittent jaundice for six weeks which had now settled down into a jaundice of the progressive type. She had a little pain in the right subcostal region and had complained of slight flatulence. The gall-bladder could not be palpated, and Murphy's sign was negative. A preliminary diagnosis of gall-stones in the common bile-duct or new growth of the bile-ducts was made. A duodenal tube was passed and some of the contents of the stomach collected. The tube was then passed into the duodenum, which was found to be empty or contained mucus too thick to come up the tube. Magnesium sulphate solution was injected in the ordinary way and some was aspirated at frequent intervals for three-quarters of an hour. Each specimen was almost clear and showed no trace of bile-pigment. The tube was then withdrawn into the stomach and a second specimen of the gastric content obtained. On analysis the duodenal content was found to be very rich in trypsin and lipase, but quite free from bile-pigments and salts. The two stomach specimens contained no lipase. It seems clear, therefore, that there had been a free secretion of pancreatic juice into the duodenum. At operation it was found there was a new growth involving the common bile-duct and the hepatic ducts, but leaving the pancreas and ampulla of Vater clear.

The presence of pancreatic juice in this case cannot be explained by the mechanical action of stimulated muscle or by osmotic action. It appears that the pancreas had definitely been stimulated to secrete, and this implies the liberation of secretin. Apperly and Cameron[4] devised a test by which they claim to estimate the alkalinity of the pancreatic juice and so test the pancreatic efficiency. They state that an acid solution in the stomach induces regurgitation from the duodenum of its alkaline contents to neutralise it, and that the neutralising properties of the saliva, bile, and succus entericus are relatively so small that an estimation of the amount of alkali used up in neutralising the acid may be taken as indicative of the quantity of pancreatic juice secreted. A narrow-bore stomach-tube is passed into the fasting stomach and the contents aspirated, then 250 c.cm. of 0·4 per cent. HCl are passed into the organ. Specimens are drawn off every 15 minutes and titrated for acid, the results being plotted on a curve. Before withdrawing each specimen the contents of the stomach are mixed by filling and emptying the syringe two or three times. The rate of neutralisation gives a rough comparison of the rate of production of pancreatic juice in different people, provided there is no obstruction, organic or tonic, to the normal duodenal reflex.

Chemical Examination of the Blood, Urine, and Stools.

This affords much useful information of the external and internal secretions of the pancreas. It is outside the scope of this lecture to deal with the technical details of the laboratory investigations, and only the main objects of the experiments can be described.

Blood.—Examination of the blood for sugar, diastase, lipase, and cholesterol have been carried out in a number of cases. Excess of sugar and diastase indicate a pancreatic insufficiency. Lipase is generally constant at 0·2–0·3, but where there is inflammatory disease of the biliary passages associated with the formation of gall-stones the cholesterol content shows a well-marked increase.

Urine.—The urine is examined for sugar, diastase, and indican. The detection of sugar in the urine is the oldest test for pancreatic insufficiency; as a quantitive test it has now given way almost entirely to the estimation of blood-sugar. The diastase content of normal urine varies from 10–30 units, with an average of about 22·5. In certain diseases of the pancreas, more especially inflammatory, the diastase content rises considerably, generally being found to vary between 50 and 200 units. In one case of acute hæmorrhagic pancreatitis the figure reached 1000 units. Later I will endeavour to show that an increased diastase is dependent upon disturbed function of the parenchyma, and may reach a high figure without any increase in the blood-sugar, which is generally accepted to be due to interference with the islands of Langerhans. Indicanuria is an indication of intestinal toxæmia, and occurs in all cases of deficiency of the external secretion of the pancreas.

Stools.—Many tests for pancreatic sufficiency have been devised which depend upon examination of the stool for the end-products of pancreatic digestion. Excess of fat, undigested muscle-fibre, particularly muscle nuclei, and the absence of proteolytic ferment are all taken as evidence of a decrease in the amount or the activity of the pancreatic juice. Sahli's test consists of feeding the patient with a gelatin capsule hardened to resist the gastric juice and containing iodoform. This should be digested by the pancreatic juice and iodine detected in the urine and saliva in less than eight hours, delay over that period being through the lymphatic vessels of the head of the pancreas, with the primary focus generally in the gall-bladder. In an apparently undue proportion of cases gall-stones are found in the common bile-duct. Maugauret suggested that this is the result rather than a cause of the pancreatitis, as pressure exerted by the sclerosis of the head on the common bile-duct causes narrowing of the passage and the arrest of the stone. This explanation is accepted by Dever and Ashurst and seems to be the correct one.

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[4] Med. Jour. of Australia, May, 1923, p. 521.

The clinical manifestations of interference with the external secretion of the pancreas are much less than they are in catarrhal pancreatitis. Diarrhœa is rare, and nausea and vomiting usually occur late. The lack of complete digestion of protein paves the way for considerable intestinal intoxication from the end-products of bacterial decomposition, and these toxins themselves may have some effect in increasing the pancreatic fibrosis. Glycosuria only occurs in fairly advanced cases, but an increase in the diastase content of the urine is almost constant, the figures varying from 35 to 50 units. This raises the point of why the diastase should be increased. The source of diastase is not known, but is certainly not the pancreas, as extirpation of the organ causes a marked increase in the ferment.

It is probable that diastase is activated by some agent that is produced by the pancreas, and that when the pancreas is diseased this agent is decreased in amount and the unactivated diastase collects in excess in the blood, to be excreted in the urine. As the islands of Langerhans are not apparently affected in interstitial pancreatitis it seems probable that the deficiency of the activating agent of the diastase is dependent upon the destruction of the parenchyma, and I suggest that it is from these cells that it is derived.

Acute Pancreatitis.—There has been much speculation as to the cause of acute pancreatitis, and much work has been done experimentally to support different theories. Flexner found that he could produce acute pancreatitis by the injection of bile into the pancreatic ducts. He states that the bile-salts are the destructive agent, and that the inflammation produced is lessened proportionately to the increase in the ratio of colloid to bile-salts in the injected material. He argued, therefore, that in chronic infection of the bile-passages there is a loss of diffusible salts and an increase in the amount of colloid material, and in these cases chronic pancreatitis should be more common than acute. If this be accepted, we must consider the effect of removal of the secretion of the gall-bladder from the bile circulation. This may be the result of cholecystectomy or of disease—e.g., a stone impacted in the cystic duct with the formation of a mucocele. Here the bile secreted into the duodenum is deficient in mucus unless there is a gross infection of the biliary passages. I have no record of a primary attack of acute pancreatitis occurring in such a case. In fact, rather the opposite has been found. In the majority of cases of acute pancreatitis I have seen there has been mild infection of the gall-bladder resulting in an increase in the amount of mucus.

Archibald states that in infected bile the proportion of bile salts to mucus is increased 6 to 12 times, but my experience has been that this is only the case where the gall-bladder has lost its physiological functions through disease. The secreting pressure of the liver is seldom greater than 350 mm. of bile, and that of the gall-bladder is under 300 mm. of bile, but when the intra-abdominal tension is very much raised, as in straining or vomiting, the secreting pressure of the bile may be raised to 1000 mm. Mann experimented to find out whether the pressure under which bile entered the pancreatic ducts had anything to do with the cause of acute pancreatitis. He writes: "If the bile is injected under a pressure of 500 mm., or a pressure greater than the secreting pressure of the liver, and the contraction of the gall-bladder, acute pancreatitis does not occur. If the bile is injected under a pressure of 1000 mm., which was the maximum pressure produced in the common bile-duct—namely, that produced by vomiting—acute pancreatitis may occur, though rarely." Mann's results afford, I think, a very striking explanation of Nordman's experiment on the injection of bacterial cultures into the gall-bladder of a dog after ligature of the pancreatic ducts. He found that when both pancreatic ducts were ligatured the dog died of acute pancreatitis, but when only one duct was ligatured the dog died of cholangitis. The pancreatic ducts in the dog, as is generally the case in the human, have a free communication with each other. It seems certain, therefore, that when both were ligatured the pressure rose in the pancreas to the danger-point and then the infected bile did the rest. When one pancreatic duct remained patent it acted as a safety-valve keeping down the pancreatic pressure to normal, and the infected bile was powerless.

Writing with Mr. H. J. Waring in the *British Journal of Surgery* in January last we said that normally the pancreatic juice is not activated until it reaches the intestine. If, however, trypsinogen be converted into trypsin in the ducts or substance of the organ, rapid destruction of tissue must be expected, producing a condition so like a perforated gastric ulcer that Mayo has spoken of it as "perforation of the pancreas." Activation of trypsin within the gland is the predominant factor of acute hæmorrhagic pancreatitis. A number of reagents found in the body other than enterokinase can activate trypsinogen, chief among them being blood, infected bile, degenerate leucocytes, and certain bacterial toxins. It is probable that trypsinogen is only activated by infected bile when the latter contains pus cells. In the majority of cases of acute pancreatitis the trypsinogen is activated by blood. If blood be the activating agent trauma should be one of the causes of the disease, and this has often been proved. Case 9 in the article already referred to in the *British Journal of Surgery* had acute pancreatitis after a street accident.

Acute pancreatitis is generally a sequel of pancreatic lymphangitis. Here there is already congestion of the pancreas and a tendency to vomit. Now with spasm of Oddi's sphincter, a reflex from the originally infected gall-bladder, there is regurgitation of bile into the pancreatic duct. Vomiting or straining may raise the pressure of the bile, as already explained, to 1000 mm., and at this pressure some bleeding from the congested bile capillaries is bound to occur, causing liberation of the ferment trypsin whose activity is intensified fourfold by the presence of bile. It is not absolutely necessary to have regurgitation of bile to cause hæmorrhage; this may and does occur through sheer congestion.

In these two lectures I have endeavoured to show that when infection occurs in the gall-bladder a train is fired which always lights gastric fireworks, and may end in a pancreatic explosion.

DONATION TO QUEEN'S UNIVERSITY, BELFAST.—At the meeting of the Senate held on July 16th it was announced by Mr. J. H. Stirling, the treasurer, that the executors of the late Mr. J. C. White, formerly Lord Mayor of Belfast, had forwarded the sum of £30,000 as a contribution to the funds of the University. Under the terms of the bequest, of this sum £15,000 are to be devoted to the foundation of a chair in biological chemistry and to the upkeep of that department. The remaining £15,000 are to be devoted to the establishment of a chair or lectureship in bacteriology and to the purposes of that department. The Vice-Chancellor, Dr. R. W. Livingstone, in moving a vote of thanks to the executors, dwelt upon the great importance to the medical school and to the world of the subjects of biochemistry and bacteriology. The former had in recent times assumed a leading place in medicine, and from it there was promise of great advances in the near future. The University has already a lectureship in the subject, and the Royal Victoria Hospital recently added a biochemist to its staff. It is hoped that the benefaction for bacteriology may pave the way for the foundation of a separate chair, distinct from that of pathology, in that subject. This step has been for some time in contemplation.

the blood and the decreased pH of the urine (4·5). Second, that it is a reflex nervous phenomenon. As the vagus is the main secretory nerve of the gall-bladder and stomach, an inflammatory lesion of the former might be expected to cause reflex stimulation of the vagus in the stomach, resulting in a marked increase in the flow of gastric juice and in the percentage of acid. Third, that it is the natural reaction of the stomach mucosa to the presence of foreign alkali.

Rous and McMaster showed that the gall-bladder is capable of concentrating bile ten times in 24 hours, and that during its passage through the cystic duct bile is concentrated two to four times. In this way, although the gall-bladder has only an average capacity of 2½ fluid ounces, it is able to contain the product of concentration of about 30 oz. of bile, and is therefore largely responsible for the fact that in the normal individual bile does not pass directly into the duodenum when secreted by the liver. Bile is stored by the gall-bladder to be secreted when required for the process of digestion. In the diseased gall-bladder, particularly when gall-stones are present, its function as a reservoir for concentrated bile is much impaired, and there is a tendency for bile to trickle down into the duodenum in a constant stream. This may be in part compensated by the activity of Oddi's sphincter, but it seems clear that in many cases there is a leak of bile into the duodenum. Its presence then in the duodenum in the resting stage causes reflex inhibition of the pylorus and regurgitation into the stomach of small quantities of this foreign alkali.

Regurgitation.—The abnormal regurgitation of duodenal contents that occurs during stomach digestion appears to be due to a reflex through the vagus nerve. I have already stated that irritation of the mucous membrane of the gall-bladder causes a reflex irritability of the vagus which is most marked by its action on the stomach, where an increase in the amount and acidity of the gastric juice is produced, associated with relaxation of the pylorus and regurgitation from the duodenum.

Hyperchlorhydria.—True hyperchlorhydria associated with disease of the gall-bladder appears to depend upon the fact that in these cases the regurgitation into the stomach occurs in less quantity than normal, and the pancreatic juice, itself the main factor in neutralising acid chyme, may be diminished in quantity and alkalinity. It is due to a reflex through the sympathetic deriving from the ninth thoracic segment, causing a spasm of the pylorus and Oddi's sphincter. In these cases of pylorospasm there is, as I have already explained, hyperacidity and decreased pancreatic secretion. The pancreatic juice is further held up by the spasm of Oddi's sphincter, so that the possibilities of regurgitation of alkali from the duodenum are reduced to a minimum.

Hypochlorhydria.

True hypochlorhydria occurring in inflammatory lesions of the gall-bladder appears to be due to intercurrent disease, although it occurs regularly in advanced cases of carcinoma of the gall-bladder.

Gastric and Duodenal Ulcer.

The increase in the amount of hydrochloric acid secreted by the stomach might have been expected to be responsible for the presence of gastric and duodenal ulcers in patients suffering from a diseased gall-bladder, and duodenal ulcer particularly has been described both as a cause and result of cholecystitis. In the series of cases which I have examined or whose operation or post-mortem records I have searched the presence of these ulcers has been so rare (two duodenal and one gastric ulcer in 500 cases) as to warrant the statement that they occur only as intercurrent diseases. The presence of the ulcer is generally diagnosed on the clinical history, and the presence of blood in the vomit is taken as pathognomonic, but gastric bleeding is not very infrequent in gall-bladder disease. Woolsey places these figures as high as 5 per cent. I have only come across it three times and in neither case was any gastric lesion discovered at operation, although, of course, the stomach was not opened. Floersheim states that gastric hæmorrhage as an accompaniment of appendix and gall-bladder disease seldom shows any pathological change in the stomach.[8]

CHANGES IN THE PANCREAS ASSOCIATED WITH THE DISEASED GALL-BLADDER.

Catarrhal Pancreatitis.—I have already given a brief description of the clinical features of this disease —periodic attacks of nausea, vomiting, and diarrhœa with bulky stools laden with undigested fat. The attack is nearly always heralded by a bout of shivering and a feeling of vague abdominal discomfort.

If the abdomen be opened during an attack the head of the pancreas and sometimes part of the body are found to be swollen and hyperæmic. It is very evident, therefore, that the condition is due to an inflammatory process; the rise of the temperature preceded by a shivering attack suggesting that it is the result of pyogenic infection. The route by which infection reaches the pancreas in these cases, and indeed the primary focus, may vary, although in the majority of cases it seems clear that the bacteria are carried from the gall-bladder to the pancreas via the lymphatics. In catarrhal pancreatitis the disturbance of the external secretion is far greater than of the internal secretion, and as the attack generally lasts for such a short time and only the proximal part of the organ seems to be affected macroscopically, it seems probable that the main symptoms are due to temporary obstruction rather than to the suppression of secretion. The absence of jaundice in the majority of these cases is proof that the ampulla of Vater is patent; the obstruction must therefore be further back involving the main pancreatic ducts, and may be due to swelling of the mucous membrane of the ducts or to pressure by the swollen pancreatic tissue. If this latter were the case jaundice should be of more frequent occurrence, for the terminal part of the common bile-duct is buried in the head of the pancreas and should be subject to equal pressure. Evidence of disturbance in the internal secretion is given by the alteration of the diastase content of the urine and occasionally by the presence of glycosuria. In a case of a woman of 45, who was under observation for a long period and whose attacks were of frequent and long duration, the diastase unit was usually under 20, although on one occasion it rose to 50. At no time was any trace of sugar found in the urine and the blood-sugar remained normal. An interesting case is described by Seale Harris.[9] An insurance agent, aged 35, came under treatment for diarrhœa. He had had an operation for gall-bladder infection, when the pancreas was found to be enlarged and inflamed. His stools showed azotorrhœa and steatorrhœa. His urine contained a trace of sugar, and his blood-sugar was 700 mg. per 100 c.cm.

Chronic Interstitial Pancreatitis, according to Opie, may be of three types: interlobular, interacinar, and a degenerate lipomatosis. The interlobular seems to be the only variety associated with gall-bladder disease. Macroscopically the head of the pancreas is found to be somewhat enlarged, nodular and hard, resembling carcinoma. In old-standing cases the changes may extend along the whole body of the organ. Microscopically there is found to be a large increase in fibrous tissue involving the interlobular spaces. As the disease advances there is gradual destruction of the parenchyma by pressure or sometimes by direct infiltration with fibrous tissue. The islands of Langerhans, on the other hand, escape for the most part, and by the destruction of alveoli appear to be in greater numbers than normal. When they are affected it seems to be rather by having their blood-supply cut off than by being themselves subjected to pressure. This form of chronic pancreatitis seems to be invariably caused by infection in lactose and saccharose on prolonged incubation, and both produced acid and clot in litmus milk in 11 days. The subculture was more rapid in its action on saccharose than the original culture. The milk control tubes (*a*) uninoculated, (*b*) inoculated with *B. Flexner* V. showed no visible change in 12 days. The organism was non-motile and was negative for production of indol. It was noted that after 24–28 days the lactose and saccharose fluid media tended to become alkaline. Animal experiments will be detailed later.

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[8] Quoted by W. J. Frick and R. D. Irland, Surg. Clinics of North America, December, 1923.

[9] Amer. Med. Assoc., Nov. 3rd, 1923.

The reactions just described place the bacillus in question outside the Flexner group of dysentery bacilli, apart from the fact that it gave negative results in agglutination tests with *B. Flexner* V, W, X, Y (Oxford), and Z. Excepting the reaction in litmus milk, this T. C. bacillus resembles in "sugar" fermentations, non-motility, and negative indol formation the Sonne III. type of dysentery bacilli. Marked differences from this type were: (1) greater toxicity of the T. C. bacillus, assuming it to have caused death: (2) its greater sensitiveness in agglutination tests with normal sera: (3) behaviour in litmus milk.

It was found when blood serum agglutination tests with the T. C. organism were being done, that the highest end-point reached (400) was with a serum that had no connexion with the outbreak. This reaction was given in five hours. The best reaction on the part of those concerned in the outbreak was an end-point of 125 in five hours and 250 in 22 hours, given by the serum of one of the patients in the first week of illness, and an end-point of 150 in 22 hours given by a second patient in the first week of illness. The serum of this second patient reacted in a dilution of 200 on the sixteenth day and in a third test on Oct. 3rd. Though there is no significant variation in the titre of the serum in these three tests, the figures seemed notable in the presence of saline controls which were uniformly negative. But when the behaviour of the T. C. organism was observed in the presence of serum controls in addition—a series of 21 of them was used—it was seen that the above reactions were not specific. Ten of these controls gave a reaction in varying dilutions. One of them gave an end-point of 40 in three hours, and 250 in 23 hours. The seven controls which were tested in dilutions of 50 and upwards all reacted in the 50 dilution at least when given 23 hours. It followed that so long as the organism retained this sensitiveness to the action of human blood-serum, the results of agglutination tests with it and the sera of the five patients admitted to hospital gave no help.

The T. C. bacillus was not found in the fæces or urine of any of the five patients, and it was the only organism to which any degree of suspicion was attached as the result of the cultural examinations to which the lungs, spleen, blood, stomach and intestinal contents, and urine were subjected. It was found only in the intestine. The enlarged spleen was sterile. The conclusion reached at this stage of the investigation was that this organism possessed a relationship to the lactose-fermenting coliforms from its fermentative and other cultural characters, which marked it off from those of any known group of dysentery bacilli. Discussion of its serological properties and pathogenicity appears later.

Microscopical examination of the organs revealed no notable departure from the normal, with the exception of the excess of lymphoid tissue in the stomach and intestine. Examination of polony sausage and of Lorne sausage derived from the boys' hostel was made by cultural methods and by animal experiments, and did not furnish any organism which came under suspicion.

In dealing with the cases of the four boys from the hostel, admitted to Belvidere Hospital, and with the case of Mrs. J., in the Eastern District Hospital, the fæces and urine were examined and were found not to contain any organism of recognised pathogenicity. The blood-sera of the five were also subjected to exhaustive and repeated agglutination tests, but no results relating them to organisms of known pathogenicity were reached. These serum tests were done towards the end of the first week in hospital and again on August 31st. The lapse of such an interval would warrant the expectation of a positive result had the infection been due to any of the usually recognised aerobic food-poisoning organisms. As already described, these sera were also put against the T. C. organism, and a small amount of blood available from the T. C. case was put against *B. paratyphosus* B with negative result.

Two months after this outbreak, and not associated with it, a bacillus having all the biochemical characters of the T. C. bacillus was isolated in this laboratory from the fæces of a patient, R. R., who had been suffering from intestinal trouble for over a year. This bacillus R. R. was non-motile, did not form indol, nor liquefy gelatin, and fermented glucose and mannite with acid production without gas in 24 hours. Lactose and saccharose were unaffected until a date beyond the ninth and under the thirteenth day of incubation, when fermentation took place with acid production. Dulcite remained negative. After a sojourn of the organism for four days in a guinea-pig it was found that on the sixth day of incubation saccharose, and on the eighth day lactose, were fermented with acid production. Litmus milk remained acid till the eleventh day, when clotting took place. A tabular comparison of these characters shows the similarity:—

TABLE I.—*First Isolation.*

Organism.	Gluc.	Lact.	Sacch.	Dulc.	Mannite.	Motility.	Indol.	Litmus milk.	Gelatin.
I. { Bacillus T. C. ,, R. R. }	A	—	—	—	A	—	—	Slight A	—
II. { ,, T. C. ,, R. R. }	A	A	A	—	A	—	—	A.C. (11 days)	—

I. = tubes read up till 9 days' incubation.
II. = ,, ,, from 9–12 days' incubation.

Both organisms ferment maltose with production of acid in 24 hours, turning to alkalinity in about 10 days in the aerobic part of the fermentation tube, but do not ferment inosite or salicin. The two organisms are, therefore, in those respects identical. Evidence was also obtained that bacillus R. R. was identical with the T. C. bacillus serologically. A rabbit antiserum prepared with the T. C. bacillus agglutinated the homologous bacillus and bacillus R. R. to precisely the same point, a dilution of 3120, while the serum of the animal antecedently to immunisation failed to agglutinate either organism in any dilution. Bacillus R. R. as isolated from the fæces in the ordinary way, also had the character possessed by the T. C. bacillus of being sensitive to "normal" human sera. The agglutination reaction in a dilution of 200 given by the former in a test with the patient's own serum was lost after the organism had been four days under the skin of a guinea-pig. The behaviour is seen in Table II.

For the purpose in view it did not appear necessary to carry the serum controls to further dilutions, and it is clear that there were *no agglutinins in the serum* of the patient R. R. to the corresponding organism. It is clear from a view of the above facts, taken together with the fact that the bacillus R. R. absorbs all the agglutinins from an agglutinating serum of titre 3120 prepared with the T. C. organism, that these two organisms are to be regarded as identical. It was to be expected that had the bacillus R. R. been the cause of the trouble in an illness of over a year's duration, there would have been related agglutinins in the blood-serum. The absence of these was of value in removing suspicion from a bacillus which was not of the proteus type. If, then, this organism is not accepted as of pathogenic import in the case of R. R., an additional ground is furnished for rejecting what is taken to be

AN OUTBREAK OF FOOD POISONING IN GLASGOW:

A CLINICAL AND BACTERIOLOGICAL INVESTIGATION.

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AN outbreak of sickness of some severity, suspected to be due to food, occurred last August in a working boys' home in the east end of Glasgow. As some points of interest arose on the clinical side, and others have emerged as the result of exhaustive laboratory investigations, we think that a brief account of the outbreak is worth adding to the records of similar occurrences. For the entire bacteriological work Dr. Wiseman is responsible.

The home accommodates about 80 working lads, all of whom live in and have their meals on the premises. They are apprenticed out at various occupations throughout the city. Out of the personnel, 80 inmates and four staff, practically all of whom shared the same institutional diet, 15 of the boys and one of the maids developed more or less acute abdominal symptoms, while the remainder entirely escaped even minor disturbance. One of the lads (T. C., aged 20) died suddenly after an illness of less than 24 hours' duration, another became dangerously ill, while three others became severely ill.

General Symptoms.

Symptoms common to the majority were abdominal pain, headache, sickness with vomiting, and diarrhœa. Colic pains were complained of by all except one patient, severe frontal headache by all except three, acute enough in the severer cases to give the face a dazed expression. Vomiting, though frequent, was neither prolonged nor severe, occurred early, and was accompanied or succeeded by diarrhœa lasting from 12 to 24 hours. Excluding those earlier cases which were not observed during the acuter stages, all the others had temperatures varying from 100° to 103° F., returning to normal after the irritative symptoms had disappeared. The clinical characteristics of the outbreak were, therefore, sudden onset with brief and sharp course, symptoms of gastro-intestinal irritation, accompanied by fever with severe headache, and followed by rapid convalescence.

An Illustrative Case.

M. McA., aged 19. This lad took ill about 11 P.M. on August 14th, with abdominal pain, headache, vomiting, and diarrhœa, all of which became very severe during the night. On the morning of the 15th his condition was serious, with great prostration, lividity of face, cramps in the limbs, somnolence, heavily furred tongue, pain and tenderness in the upper region of the abdomen, temperature 102° F., with a dry skin. He was admitted to hospital in the early afternoon, where he vomited a quantity of bright jade green material, the stools being loose, small, and green. Towards evening he became dangerously ill, with feeble pulse and deepening cyanosis. Diarrhœa continued infrequently next day, vomiting occurred once, and his general condition improved. By the following day, the 17th, the irritative symptoms had ceased and the patient was out of danger.

The chart shows the progress of the pulse and temperature. Three of the severer cases who were admitted to hospital for treatment show the same continued fall in the pulse after the temperature had rapidly subsided to normal.

The fatal case (T. C., aged 20) first complained of sickness, vomiting, and thirst on the evening of August 14th, although it appears that he had not been well at his work during the day. He had diarrhœa during the night, and, when the bed-clothes were about to be changed at 7 A.M., he suddenly collapsed and died. The results of the post-mortem and of the bacteriological examination are given later.

The maid, who was the only one of the staff to sicken, took ill on the night of August 13th and was admitted to hospital next day, sharply ill with vomiting, diarrhœa, and temperature 101° F. The stools consisted of blood and mucus; this was the only case in which blood was noticed in the fæces.

Source of the Illness.

As nearly as could be ascertained the periods of sickening of the 16 cases were as follows: morning of August 13th, five cases; evening of same day, one case; morning of 14th, five cases; evening of same day, five cases. The one fatal case and the more severe cases belong to this last group.

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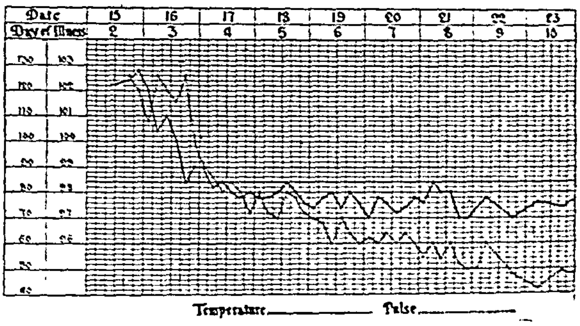

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It was found when blood serum agglutination tests with the T. C. organism were being done, that the highest end-point reached (400) was with a serum that had no connexion with the outbreak. This reaction was given in five hours. The best reaction on the part of those concerned in the outbreak was an end-point of 125 in five hours and 250 in 22 hours, given by the serum of one of the patients in the first week of illness, and an end-point of 150 in 22 hours given by a second patient in the first week of illness. The serum of this second patient reacted in a dilution of 200 on the sixteenth day and in a third test on Oct. 3rd. Though there is no significant variation in the titre of the serum in these three tests, the figures seemed notable in the presence of saline controls which were uniformly negative. But when the behaviour of the T. C. organism was observed in the presence of serum controls in addition—a series of 21 of them was used—it was seen that the above reactions were not specific. Ten of these controls gave a reaction in varying dilutions. One of them gave an end-point of 40 in three hours, and 250 in 23 hours. The seven controls which were tested in dilutions of 50 and upwards all reacted in the 50 dilution at least when given 23 hours. It followed that so long as the organism retained this sensitiveness to the action of human blood-serum, the results of agglutination tests with it and the sera of the five patients admitted to hospital gave no help.

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In dealing with the cases of the four boys from the hostel, admitted to Belvidere Hospital, and with the case of Mrs. J., in the Eastern District Hospital, the fæces and urine were examined and were found not to contain any organism of recognised pathogenicity. The blood-sera of the five were also subjected to exhaustive and repeated agglutination tests, but no results relating them to organisms of known pathogenicity were reached. These serum tests were done towards the end of the first week in hospital and again on August 31st. The lapse of such an interval would warrant the expectation of a positive result had the infection been due to any of the usually recognised aerobic food-poisoning organisms. As already described, these sera were also put against the T. C. organism, and a small amount of blood available from the T. C. case was put against *B. paratyphosus* B with negative result.

Two months after this outbreak, and not associated with it, a bacillus having all the biochemical characters of the T. C. bacillus was isolated in this laboratory from the fæces of a patient, R. R., who had been suffering from intestinal trouble for over a year. This bacillus R. R. was non-motile, did not form indol, nor liquefy gelatin, and fermented glucose and mannite with acid production without gas in 24 hours. Lactose and saccharose were unaffected until a date beyond the ninth and under the thirteenth day of incubation, when fermentation took place with acid production. Dulcite remained negative. After a sojourn of the organism for four days in a guinea-pig it was found that on the sixth day of incubation saccharose, and on the eighth day lactose, were fermented with acid production. Litmus milk remained acid till the eleventh day, when clotting took place. A tabular comparison of these characters shows the similarity:—

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Both organisms ferment maltose with production of acid in 24 hours, turning to alkalinity in about 10 days in the aerobic part of the fermentation tube, but do not ferment inosite or salicin. The two organisms are, therefore, in those respects identical. Evidence was also obtained that bacillus R. R. was identical with the T. C. bacillus serologically. A rabbit antiserum prepared with the T. C. bacillus agglutinated the homologous bacillus and bacillus R. R. to precisely the same point, a dilution of 3120, while the serum of the animal antecedently to immunisation failed to agglutinate either organism in any dilution. Bacillus R. R. as isolated from the fæces in the ordinary way, also had the character possessed by the T. C. bacillus of being sensitive to "normal" human sera. The agglutination reaction in a dilution of 200 given by the former in a test with the patient's own serum was lost after the organism had been four days under the skin of a guinea-pig. The behaviour is seen in Table II.

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AN OUTBREAK OF FOOD POISONING IN GLASGOW:

A CLINICAL AND BACTERIOLOGICAL INVESTIGATION.

BY W. R. WISEMAN, M.B., B.Sc., F.R.F.P.S. GLASG.,
BACTERIOLOGICAL LABORATORIES, PUBLIC HEALTH DEPARTMENT, GLASGOW;
AND
A. S. M. MACGREGOR, O.B.E., M.D., D.P.H.,
PUBLIC HEALTH DEPARTMENT, GLASGOW.

AN outbreak of sickness of some severity, suspected to be due to food, occurred last August in a working boys' home in the east end of Glasgow. As some points of interest arose on the clinical side, and others have emerged as the result of exhaustive laboratory investigations, we think that a brief account of the outbreak is worth adding to the records of similar occurrences. For the entire bacteriological work Dr. Wiseman is responsible.

The home accommodates about 80 working lads, all of whom live in and have their meals on the premises. They are apprenticed out at various occupations throughout the city. Out of the personnel, 80 inmates and four staff, practically all of whom shared the same institutional diet, 15 of the boys and one of the maids developed more or less acute abdominal symptoms, while the remainder entirely escaped even minor disturbance. One of the lads (T. C., aged 20) died suddenly after an illness of less than 24 hours' duration, another became dangerously ill, while three others became severely ill.

General Symptoms.

Symptoms common to the majority were abdominal pain, headache, sickness with vomiting, and diarrhœa. Colic pains were complained of by all except one patient, severe frontal headache by all except three, acute enough in the severer cases to give the face a dazed expression. Vomiting, though frequent, was neither prolonged nor severe, occurred early, and was accompanied or succeeded by diarrhœa lasting from 12 to 24 hours. Excluding those earlier cases which were not observed during the acuter stages, all the others had temperatures varying from 100° to 103° F., returning to normal after the irritative symptoms had disappeared. The clinical characteristics of the outbreak were, therefore, sudden onset with brief and sharp course, symptoms of gastro-intestinal irritation, accompanied by fever with severe headache, and followed by rapid convalescence.

An Illustrative Case.

M. McA., aged 19. This lad took ill about 11 P.M. on August 14th, with abdominal pain, headache, vomiting, and diarrhœa, all of which became very severe during the night. On the morning of the 15th his condition was serious, with great prostration, lividity of face, cramps in the limbs, somnolence, heavily furred tongue, pain and tenderness in the upper region of the abdomen, temperature 102° F., with a dry skin. He was admitted to hospital in the early afternoon, where he vomited a quantity of bright jade green material, the stools being loose, small, and green. Towards evening he became dangerously ill, with feeble pulse and deepening cyanosis. Diarrhœa continued infrequently next day, vomiting occurred once, and his general condition improved. By the following day, the 17th, the irritative symptoms had ceased and the patient was out of danger.

The chart shows the progress of the pulse and temperature. Three of the severer cases who were admitted to hospital for treatment show the same continued fall in the pulse after the temperature had rapidly subsided to normal.

The fatal case (T. C., aged 20) first complained of sickness, vomiting, and thirst on the evening of August 14th, although it appears that he had not been well at his work during the day. He had diarrhœa during the night, and, when the bed-clothes were about to be changed at 7 A.M., he suddenly collapsed and died. The results of the post-mortem and of the bacteriological examination are given later.

The maid, who was the only one of the staff to sicken, took ill on the night of August 13th and was admitted to hospital next day, sharply ill with vomiting, diarrhœa, and temperature 101° F. The stools consisted of blood and mucus; this was the only case in which blood was noticed in the fæces.

Source of the Illness.

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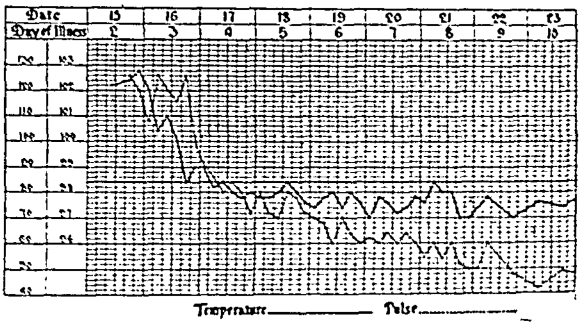

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TABLE II.—*Agglutinations.*

Organism.	Patient "R. R.'s" serum dilution.				Hours.
	25	50	100	200	
Bac. "R. R." (1st plate isolation).	+ +	+ +	+	+	22
Bac. "R. R." (guinea-pig).	—	—	—	—	
Bac. T. C. (rectum).	+ +	+ +	+	Tr +	

Serum Controls.

—	Ser. 71.		Ser. 87.		Hours.
	25	50	25	50	
Bac. "R. R." (1st isolation).	+ + +	+ + +	+ + +	+ + +	22 at 50° C.
Bac. "R. R." (guinea-pig).	+	+	+	+	
	Ser. 85.		Ser. 32.		
Bac. T. C. ..	+ + +	+ + +	+	—	

Saline controls were always negative.

On August 9th, almost concurrently with this outbreak, a lactose-fermenting coliform bacillus, *B. communior* (MacConkey, 1905), was isolated by one of us from the blood of an adult patient, Mrs. F., whose symptoms very much resembled those of enteric fever, who resided not far from the boys' hostel, but was not associated with the outbreak. The same organism was isolated from a second hæmoculture of this patient on the 15th, and a bacillus culturally identical with it was present in the fæces and urine. Her blood-serum on the latter date had an agglutination titre of 2500 against this organism, serum and saline controls giving no reaction. This occurrence supported the desire to make a complete survey of the reputedly non-pathogenic coliform bacilli found in the fæces of the five patients of the boys' hostel and in the alimentary tract of the boy who died. The only organism of this kind common to the majority of the sufferers—it was found in five out of six, and was present in the stomach contents of T. C.—was *B. communior*. On the assumption that it might have taken on a pathogenic character in some foodstuff that had escaped collection and examination, it was thought expedient to ascertain if the patient's sera in our possession would throw light on this possibility. Two sets of sera were available, one set of five taken towards the end of the first week of illness, and one of four taken on the sixteenth day. Agglutination tests were done with all these sera and the *B. communior* of the five patients. If this organism were the causal agent, it was clear that the five cultures, or the majority of them, would be homologous and would give the same reactions with any one serum. It became obvious that they did not do so. In only one test out of 25, with the first set of sera, was a reaction given in a dilution of 50, five reacted in a 25 dilution, and in 10 of the tests (five of which pertained to one organism) no reaction was given. The saline controls were always negative, while of 22 serum controls used one gave a reaction in a 200 dilution with the *B. communior* of T. C. It was noted also that it was not a feature of the results that a given patient's serum gave a better raction with his own organism than with one or more of the others. When it was seen in the tests with the second set of patient's sera that there was practically no variation in the titres between August 22nd and 31st, the conclusion was reached that we were not dealing here with an ætiological factor. The immune sera of three rabbits prepared by inoculation with two of these organisms and with that of Mrs. F. (hæmoculture) showed definitely that these three bacilli were heterologous.

It would seem to follow from this that the moderate reactions just described are not on a par with those given by certain "normal" sera with *B. enteritidis* Gaertner—e.g., in a series of 50 normal sera tested in this laboratory against *B. enteritidis* Gaertner 10 gave good reactions in a dilution of 85; of these 10, five reacted in a 125 dilution and two reacted well in a 250 dilution. The absorption tests done on these last two, and on one of the five, showed complete absorptions. The serological specificity of *B. enteritidis* Gaertner renders it likely that these results indicate a specific relation between this bacillus and the sera. On the other hand, similar reactions with different strains of *B. communior*, freshly isolated and proved heterologous, evidently mean some degree of sensitiveness to the action of certain human sera simply as such.

The search for anaerobic bacilli in this investigation did not produce any indication that any solution was to be found along this line.

The Ætiological Factor a Toxin.

In dealing with all the living micro-organisms that could by any possibility have caused this outbreak, we have wished to place upon a sound basis of fact our conviction that it was due to the ingestion of a toxin. It remains obscure what the nature of the toxin was, much yet remaining to be done to place the isolation of such bodies from foodstuffs and their description upon a satisfactory basis.

Animal Experiments to Ascertain Pathogenicity.

The following animal experiments were carried out to ascertain pathogenicity:—

(*a*) Half of the washings of 3 grammes of polony sausage and of Lorne sausage, which were derived from the home, were injected subcutaneously into guinea-pigs. The animals remained well.

(*b*) 0·1 c.cm. of a 24 hours' broth culture of the organism referred to as the T. C. bacillus (found in the rectum post mortem) was given subcutaneously to a guinea-pig on Sept. 5th. The animal remained well. On Nov. 21st a guinea-pig received intraperitoneally 2 c.cm. of the filtrate of a five days' broth culture of this organism and remained well. On April 10th, 1924, a guinea-pig was given subcutaneously 0·5 c.cm. of an 18 hours' broth culture, while another received 0·5 c.cm. of the same culture intraperitoneally. Both animals remained well.

(*c*) To be correlated with (*b*) are the experiments with the identical bacillus R. R. A guinea-pig received a subcutaneous inoculation of a saline emulsion of the fæces of the patient R. R. and was killed in four days. There was a dense fibrinous exudation at the site of inoculation and the late lactose-fermenting bacillus was found here by culture without difficulty. It was not found in the contents of the large or the small intestine. Blood culture was negative.

A feeding experiment was done with the same saline emulsion as used for the inoculation with no discernible pathogenic effect.

Experiment with Pure Culture of Bacillus R. R.—On Nov. 29th, 1923, 11 days after the first isolation of the organism, a guinea-pig received subcutaneously 0·5 c.cm. of a 24 hours' broth culture (from fourth subculture on agar). On Dec. 7th there was an indurated swelling 1½ inches by 1 inch at the site of inoculation. On the 11th the swelling was somewhat less in area, 2 inches by ½ an inch, and apparently very tender. The animal was otherwise well, and ultimately recovered.

(*d*) The *B. communior* from the stomach of T. C. and that from one of the patients, H., were tested by subcutaneous inoculation of broth cultures in guinea-pigs with negative results. The former was also grown for five days in bouillon and a guinea-pig fed with 2 c.cm. of the filtrate, while another guinea-pig received 1 c.cm. of the filtrate intraperitoneally. Both experiments gave negative results.

Conclusions.

1. It is held that, even in the absence of access to a sample of the meat upon which suspicion mainly fell, the investigations described have been sufficiently comprehensive to exclude the direct action of a living micro-organism, apart from a filtrable virus, as the cause of the outbreak.
2. Before direct microbial action could be excluded, a detailed investigation was made upon an organism of rare occurrence in the human intestine, which organism was found in the fatal case and also in a case of intestinal trouble not associated with the outbreak. Grounds are given for regarding the outbreak as not attributable to this organism.
3. The bacilli described as T. C. and R. R. appear to be members of a serological group which is either a new group or one of very uncommon occurrence. Further, the bacillus R. R. was found to be moderately pathogenic to guinea-pigs.
4. The clinical data (including the selective incidence) combined with the bacteriological results furnish strong grounds for the view that the outbreak was due to a powerful toxin which had an uneven distribution in the material consumed.

AN INQUIRY INTO THE ORIGIN OF SQUINT, LEFT-HANDEDNESS AND STAMMER.

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THE nature and origin of concomitant squint have been explained in physiological terms, but its capricious incidence indicates that further factors must be involved beyond the known physiological ones. Its mode of onset and variability in states of fear or other excitement suggest that, whatever may be the influence of an error of refraction, some other factor must be at work determining the breakdown of the binocular function; but the difficulties of direct investigation of the child's mind appeared insurmountable, and for some time after my attention was drawn to such a possibility I had to content myself with observations confirming the suspicion that the deformity was dependent upon mental states. Soon it was noticed that several squinting patients were left-handed, and further investigation elicited the fact that even when not left-handed themselves a large proportion of the children had left-handed relatives. From this point it was natural to turn to the incidence of stammering, which for many years has been considered a congener of left-handedness, and I discovered that a family history of stammering could often be obtained. Why should a habit which represented a harmless departure from the custom of the herd, carrying with it no generally recognised physical or mental disability, be associated with serious defects of sight and speech? Whatever may be the explanation, the question suggests new paths by which to investigate the origin of squint, if the association of the abnormalities can be established.

I have been able to collect 1000 cases of squint, very few of which have failed to reveal the existence of left-handedness or stammering in some near relative, and it is hoped that the typical instances quoted will be of sufficient significance to justify the absence of statistical proof of the association. Seeking a physical explanation of the relationship seemed like the proverbial search for a needle in a haystack. Stammering has long been recognised to be a "nervous" symptom, and squint is commonly seen to vary with the emotional reactions of the child, so it appeared that research into the relationship of mental states with all three conditions would be more profitable than inquiry into possible structural peculiarities.

Left-handedness.

Though left-handedness has never yet been classified among diseases, yet a most striking feature is the intolerance shown towards it. But this attitude is directed only towards children. Once the individual has been able to weather the storm of disapproval from parents and teachers, he is left alone, and may even be commended if the left-handedness be applied to games. In cricket, especially, we like a left-handed bowler or batsman on our side, for he has a sphere of usefulness which no one else can fill. Superficially regarded, the left-hander is as other men. Often, however, he *is* different from his fellows in certain subtle ways, and the difference seems to be connected with the difficulty experienced in childhood in establishing his right to do as he pleases. Whether he was born with a capacity for complete ambidexterity, and clings to such left-handed activities as have survived parental pressure, or whether he has actually adopted left-handedness as a sign of his desire to be different from the authoritative parent, the fact remains that he is almost invariably more critical and self-sufficient than the other members of the family.

The reason for the normal habit of right-handedness is unknown, and a considerable proportion of children show an inclination to use either hand in their earliest activities. As a rule, perhaps from training or example, the right hand soon becomes dominant, and a habit is formed which remains through life, though sometimes there seems to be a reservation in the individual's mind, for I have patients who assert that notwithstanding their right-handedness, they "feel" left-handed. Such a case, a right-handed woman of 28, came under my notice last year. It was found that the girth of the left arm was three-quarters of an inch larger than the right. Further, the measurement across the left breast was larger than that of the right by the same amount. There was nothing in the medical history to account for this difference, or for the "feeling" of left-handedness. Another right-handed patient, a woman of 25, told me that it was "the greatest ambition of her life to be left-handed."

Development of the Condition.—So far as I know, few investigations have yet been made into the earliest manifestations of left-handedness, such records as exist being merely incidental to other aims. An instance of late emergence of left-handedness came to my notice recently.

A naval officer had occasion for the first time to chastise his little girl of 4, for naughtiness. Later in the day, when good relations appeared to have been re-established, she was invited to play a game invented in the family. Over the perforated seat of a chair was stretched a piece of paper, and the players tried to pierce the paper over one of the holes with a lead pencil. The father tried first, and then passed the pencil to his daughter, who took it and struck with it in her left hand. When she did this a second time, the father commented upon it, and tried to persuade her to use the right hand in place of the left, but without success. This was the first occasion on which any sign of left-handedness had been given. In this family the father has a tendency to divergent squint, the mother's only brother has a pronounced convergent squint, in one or two of the other children there is a suggestion of divergent squint, and the mother, though not left-handed, uses mirror writing in making private notes.

A more significant case seems to be that of a boy of 7, who had squinted since the age of 2. He was right-handed until he was 6, when he became very friendly with a left-handed boy, and began to copy him, even to the extent of learning to write with the left hand. The habit was "broken" by the parents. No other squint, stammer, or left-handedness could be traced in the family.

A curious feature about left-handedness is that it is rarely as complete as right-handedness. We are familiar with the man who bats left-handedly, and bowls with the right hand, or vice versa. One of my patients is left-handed only for two-handed activities, such as swinging a golf club or cricket bat. Another uses a pen with the right hand and a pencil with the left. Yet another sharpens a pencil with the left hand, but at table holds knife and fork normally. A fourth invariably blows his nose with his handkerchief in the left hand. There may be one or many left-handed activities in people who are regarded by their fellows as normally right-handed.

Whatever may be the cause of this departure from the usual custom, there seems in most cases to be no reason for attributing it to physical conditions.

Emotion as a Causal Factor—I have found only one case where a left-handed parent did not object strongly to his child following his example. One man had resorted to the extreme measure of training himself to be right-handed, in order to influence his left-handed son, when coercive measures had failed. He declared that it was only a matter of "will-power." It is strange that no left-hander feels that this blame is merited; he, at least, is never ashamed of his habit. A little patient of mine was said to have become left-handed in order to please a favourite left-handed uncle. It would be interesting to know why she did not remain right-handed in order to please her right-handed father. These examples suggest an emotional factor in the development of left-handedness.

Incidence of Left-handedness.

The problem becomes more complex when we find that boys are more likely to be affected than girls. J. W. W. Ballin, in his annual report, Board of Education, St. Louis, 1915–16, found amongst nearly 90,000 pupils that the percentage of the left-handers in boys was 3·6, and amongst the girls 2·1. Mental defectives, too, include a high proportion of left-handers, and so do twins. I am under the impression that the elder twin is more likely to be left-handed, and that in large families the eldest child, especially if a boy, is more commonly affected. In the case of mental defectives it might be imagined that structural brain formation had determined the issue as to which hand should be used, but that a functional element is present is indicated by Hugh Gordon,[1] who states that "spontaneous change of left-handedness to right-handedness in writing amongst mental defectives is often found to be associated with progress in school work and in intelligence." Lombroso found a high percentage of left-handers amongst criminals. Is there a common factor present in these various classes which tend to develop the abnormality? The mental defective has a definite inferiority in comparison with his fellows, and a feeling of resentment may perhaps be attributed to him; as this inferiority passes away, he tends to conform to the usual custom. The criminal is in conflict with the herd. The boy is more aggressive and independent than the girl. The common factor which seems to emerge is a spirit of contrariness. As already stated, the attribute of left-handedness in the adult does not carry with it any imputation of blameworthiness; other things being equal, he is assumed to be as useful a member of society as the right-hander. Does he then show any sign of the spirit of contrariness? My observations point to the conclusion that in many cases the left-hander has his own peculiar temperament.

A mental expert, corresponding with me on this subject, wrote: "I have a patient who is extremely left-handed, and his past history relates terrible conflicts with his father. In fact he is the most left-handed man I have ever known, except myself! I, too, have experienced much conflict with father substitutes—e.g., commanding officers, Government officials, &c." A still more striking example of obstructiveness is that of a man, the only left-hander of his family, whose opposition to authority of any kind was so great that he relinquished post after post abroad and at home, when it appeared that he was settled for life, because some higher official ventured to control his actions. This resentful attitude towards authority can be found in most left-handers. It may be urged that mankind naturally tends to resist authority, but if the left-hander be compared with the rest of his family, brought up by the same parents, it will be found that he is generally distinguished by being to a greater degree than his fellows self-reliant, critical and obstinate, refusing to be driven, but accepting guidance from those he loves.

Relationship of Left-handedness and Stammering.

The relationship of left-handedness and stammering has been shown by the onset of the latter where forcible restraint of left-handedness has been practised. On the other hand, stammering appears sometimes to have resulted from an attempt to make a right-hander ambidextrous. An elderly father of strong personality, who is keenly interested in manual dexterity, had a right-handed daughter, whom he taught to use the left hand without much difficulty or undesirable sequelæ. An attempt to educate in the same way a son who was born two or three years later had to be abandoned owing to the development of a stammer.

Whether parental pressure had any influence in determining the incidence of left-handedness on the female side only in the following family history I was unable to ascertain.

A girl of 8 was brought to me suffering from a blinking habit. She was left-handed even for writing. She was the youngest of the family, which consisted of two sisters, the elder of whom was slightly left-handed, and one brother, who had an internal squint. The mother was left-handed for most activities; so was her only sister, but her only brother, who died at the age of 16, was normal. The mother's mother also was left-handed. There had never been any stammer in the family. Thus, for three generations left-handedness was present in the females only.

Hugh Gordon[2] published in 1920 the result of an experiment at Lingfield Colony Special Schools (Epileptic Children) upon certain "stationary" children, who seemed to have developed up to a certain point and then stuck. It had been thought that left-side training might open up additional centres in the brain, and enable education to proceed in these children, who had been stationary for two to four years. A class was formed and some progress was made, when, about five months from the commencement of the experiment, it was found that the pupils, beginning with those who were making the best and most regular advance under the "left" method, began to speak in halting phrase, and gradually developed a pronounced stammer. The speech had previously been normal. A singular fact was that so long as the movements of the left hand were purely mirror-writing movements—which was the procedure adopted at the beginning of the training—there was no interference with speech. The stammer appeared only when the left hand was made to perform movements in the same direction as those normally performed by the right. This progressive speech defect became so alarming that it was decided to abandon the left-side work in favour of ambidexterity. By the time that both hands had begun to acquire steadiness and skill, an improvement in speech was noticed, and after some weeks the defect had entirely disappeared.

On the other hand, I have known of only one case where a left-hander developed a squint when an attempt was made to enforce right-handedness.

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[1] Brain, vol. xliii., Part iv., 1920.

[2] The Times Educational Supplement, May 6th, 1920.

A boy of 7 or 8 was sent to a school where the master insisted upon his becoming right-handed. The boy found difficulty in compliance, was beaten, and at each beating developed a temporary squint. An example of the variation of squint and stammering cannot be given, though I have seen a boy who stammered more when he read the letters on the test type with the squinting amblyopic eye than he did when the other eye was used. Another boy developed a squint of the left eye after an injury when 4 years old, and a month later began to stammer. A strange case is that of a woman of 38, who, in the late months of pregnancy, awoke one morning with a paralytic internal squint of the left eye. In her alarm she called her eldest daughter, aged 19, to come and see what was wrong, and the latter, as soon as she saw the deformity, immediately began to stammer, and continued to do so for many months.

Whilst it is usual for these three abnormalities to occur singly in the various members of the family, two or all of them may be, or may have been, present in the same individual, though all may not persist. Thus it is fairly common to hear that a squinter used to be a stammerer or left-hander in childhood, without any trace being present when he grew up. An instance has been given where the left-handedness occurred only on the female side of the family. Squint, too, may be confined to one sex, as in the family of a patient aged 19, whose squint developed after going to school. He had three sisters, aged 16, 24, and 30 respectively, who were normal, whilst of three brothers, one, a squinter, died of consumption at the age of 27; a second, aged 32, also squinted; and the other, aged 12, was normal. The father and father's brother both squinted.

The Emotional Factor in Stammering and Squinting.

It is perhaps hardly necessary to say much about the emotional origin of stammering, which is commonly recognised to be a nervous symptom, but it may be interesting to notice that just as left-handedness can be partial, and squint intermittent, so can stammer be confined to specific occasions. Some stammerers are affected only in the presence of superiors, some fail at certain letters, and the experience of war cases showed that a stammer was often initiated by a single emotional experience. A sufficient number of cases have now been analysed to demonstrate the effect of emotion in starting and perpetuating the disorder of speech.

In the course of observation of squinting children I have been able to find abundant evidence that emotion may determine both the incidence and extent of the deviation. Excitement often plays a prominent part, and the following instance illustrates how fundamental may be the stresses, how early they may arise, and their value as an indication that the child's mental development is not proceeding smoothly.

A little girl of 2 years and 4 months was brought to me in July last with a left internal squint. The mother could not account for the squint, but a habit of standing on her head recently indulged in a good deal by the child, had been suggested as a cause. She was right-handed, and the speech was normal. In October the mother reported that the child had begun to stammer during the past two or three weeks, and also during the same period had become left-handed for putting food into her mouth, or for picking up anything. She used the left hand for most purposes more than the right. When asked if the emotional atmosphere at home had changed lately, the mother replied that she and her husband had not been happy together for some months, and that in the past two or three weeks they had been discussing the advisability of a legal separation. She was persuaded to attempt to readjust the differences at home, and was successful in getting her husband's coöperation towards this end for the sake of the child. A fortnight later she announced that the stammer had disappeared as quickly as it had come. The left-handedness and squint remained unchanged. A few weeks later still, the left-handedness, too, had practically gone, and the squint, though present, was much less noticeable. A point bearing upon the possible relationship of the abnormalities to unhappy home conditions is the child's jealousy of her mother. If anyone in the family put his arm round the mother, the child would push him away in a passion, shouting "Go away, that is my mummie," and would cry if she were not obeyed. It should be added as an indication of the parental trends that the father used to stammer when a boy, and that the mother suffered from fits until the age of 7, and is still so afraid of the dark that she will never go upstairs without a lighted candle. Her eldest sister is partially left-handed—e.g., for cutting bread and peeling potatoes, but in her work as corset-maker is right-handed.

A similar instance of left-handedness on the female side associated with a family history of speech defect and squint, is the following:—

A girl, an only child, aged 6, has a left convergent squint and is left-handed. Her father has a left convergent squint. He has one brother, who is normal. His father and father's sister suffered from an impediment in speech. The child's mother is left-handed, and so is her maternal grandmother. The latter's two sisters were left-handed, but her two brothers were normal. It will be seen that the left-handed woman chose a squinting husband.

That the patient is unconscious of the emotional processes at work is shown by the following case:—

A woman of 28 consulted me a year ago. As she had a tendency to squint, I asked who was left-handed in the family. She replied that it was herself. Her father stammered when nervous. She has one brother, who had crystallised his stresses into a nervous breakdown and seasonal attacks of eczema. Being interested in the occurrence of these defects in her family, she asked if any practical value was likely to follow from their investigation, and I replied that I thought I could guess some of the attributes of her future husband. I applied the above simple formula, which is really a corollary to the Freudian theory that in marriage the girl tends to seek the father substitute, and the boy the mother. If the father is left-handed, and a fixation has occurred, the daughter is attracted by a left-hander, or a man of that characteristic temperament, and so forth. I described to my patient the stammering type in general terms, and ended by saying that in all probability her husband would stammer or squint. She then told me that she had just broken off an engagement of two years' standing, preferring to remain at home with her mother. As for the defect predicted, she stated: "Everyone used to say that he squinted, but I could never see it." She thus had a blind spot for a deformity, which is connected in some mysterious manner with abnormalities occurring in herself and her father.

The selection of like characteristics is not confined to adventures matrimonial.

I know of a stammering father who had a stammering son. This boy was sent successively to a kindergarten where the mistress stammered, and to a school with a stammering headmaster. He was subsequently articled to a well-known architect, who was similarly afflicted. When I first saw his wife I recorded that although the son did not marry a stammerer, he married into a stammering family, for his wife's only sister stammers very badly. Three years later the wife complained to me that owing to worry about her only child's health, she herself had begun to stammer slightly.

In a large number of cases of squint it has been rare to find instances in which only one member of the family has been affected. Sometimes there has been an only child, or there has been a considerable difference in age between the patient and the rest of the family. On the other hand, the incidence of squint in the family may be less than might be expected from the history of its occurrence in the preceding generation. A girl of 8 showed deviation only on alternate covering of the eyes, though she used to have a well-marked squint. She has two brothers and three sisters who are normal. Yet her father's eldest and youngest sisters and also a brother have convergent squint. There is no left-handedness or stammering in the family.

Occasionally I have found monocular amblyopia without sign of present or past squint, associated with one of the other two abnormalities. This occurred in a boy of 9, an only child, who was very hypermetropic, and had unequal pupils. He was left-handed, and so was the paternal grandfather, but not the father. The boy was very fidgety and nervous, and was described as being very resistant to his mother, who was "practically an invalid from nervousness." The left-handedness in this case may be due to disease, since the history showed that he had suffered from "infantile paralysis of the right leg," the effects of which, however, had completely disappeared. The case is now recorded, because although when tested he obviously wrote better with his right hand, and admitted that it was easier than with the left, he always used the latter for writing at home.

Nature of Emotion Influencing Squint.—As a rule the nature of the excitement influencing squint is not examined by the parents, and it is difficult for the surgeon to do more than surmise as to what is passing in the child's mind.

I have seen a little girl who squinted when she sat on my knee, and faced the father (of whom the child was afraid, according to the mother's account), and yet had straight eyes when she sat on her father's knee and, facing me, accepted my friendly overtures. Another child with a squint, restless in her mother's arms, and afraid of my approaches, lost the deviation when I tickled her and made her laugh. Yet another, with 6D hypermetropia in each eye, was brought to me with a history of a squint which, however, could not be evoked even when she was without her glasses, but appeared at once when I asked her to look at her mother and be scolded, the latter having previously told me that a reprimand often upset the balance of the eyes. The same result occurred in two boys of about 10, who had recently had operations for convergent squint. The resultant parallelism had been demonstrated to another observer who was sceptical of the theory here propounded. I suddenly spoke to the boys in a loud threatening voice, and both of them immediately relapsed into a bad squint, which slowly disappeared when they realised that I had been playing a trick upon them.

A suggestive example is that of a boy of 8, whose squint dates from a fit when 6 months old. The squint is never constant, but appears only when he is nervous—e.g., when meeting strangers. He was left-handed when a baby, but was checked. He has always ridden his scooter left-footed. He has only one brother, aged 17, who stammered when a child. The father's father squinted. It will be noticed that although the left-handedness has been eradicated, he still clings to left-footedness.

A similar emotional cause may be at work in these cases, as in a left-handed girl of 7, who was referred to me because she complained that large letters on the blackboard looked small, and vice versa. She was described as being very determined and independent. She had one brother who stammered occasionally. She confided to me that the ocular phenomenon, which lasted only one week, was due to jealousy, her little girl friend having chosen someone else to play with. In her own words, "she did not want to see things right."

The following case tends to confirm the opinion that deep-seated emotional reactions may be connected with the development and persistence of squint.

I have under my care at the present time a little girl of 2¼, who developed a squint at the age of 2. The curious thing about this squint was its regular appearance and disappearance on alternate days. If she squinted on Sunday, she did not on Monday, and so on. Cases have been reported of children who wrote on some days with the left hand, and on other days with the right. The only explanation which the mother could offer was her practice of keeping the children at home every other day, whilst she worked long and hard in order to be free to take them out of doors for a long spell the next day. On one occasion she reported to me that the father had been unwell, and had stayed in bed for the day. The little girl as a treat was allowed to have breakfast in bed with Daddy. It was her "squinting" day. The father whispered to the mother that there was no squint, and during the whole time in bed none developed. When, however, the mother came to fetch her away, the squint appeared, and persisted throughout the day, "according to plan."

The reactions of a child who developed a squint at a later age afford a better opportunity of studying possible emotional causes of the deviation.

A little girl of 6 began squinting during a fit of coughing, in June, 1919. The eyes became normal in the following months, but the squint recurred in the winter, and in February, 1920, she was taken to an oculist who prescribed R. and L. +1·5 sph. At that time she was seeing double. She was brought to me in August, 1921, when I found normal vision in each eye and 8° esophoria. Diplopia could be easily induced, fusion being obtained when the object was 1 metre distant. In the following winter she had whooping-cough, and it was noticed that after a fit of coughing a definite squint was present. As the effort to overcome 1·5D hypermetropia could have little effect in throwing the eyes off their balance, I advised that the glasses should be discarded. In August, 1922, she was again examined, and the esophoria now varied from 8° to 12° or more. She had previously told her father that she was anxious for the squint to be worse, as she particularly wished to wear glasses in order to be like her mother and brother. Occasional diplopia was complained of. At the next visit, in February, 1923, it was reported that although she had not worn glasses for over 12 months, she had been quite comfortable and without squint until two days previously, when the right eye had deviated inwards momentarily. On the following day she suddenly squinted badly with the right eye during a grammar lesson at school. The mistress told her not to squint, and she immediately began to see double. I inquired closely into the possibility of a sudden strain upon the accommodation at the time of onset of the squint, but found that the child had been quietly listening to a lecture by the mistress. When I asked what special part of the subject was being dealt with, the child replied "genders." She was described to me as of an exceptionally jealous disposition, and there had been trouble in the home when the father returned after several years' absence in the war, owing to her wish to monopolise the attentions of the mother. In February the mother was dying of cancer, and the domestic arrangements required that the little girl should sleep with the father. When she came for examination in March she entered my room without a trace of squint, but when attention was paid to her the right eye deviated inwards. She now gave the impression of being a precocious child. She was seen again in May, 1923. No squint had been noticed for some weeks, although she was still without glasses, until the morning of the consultation, when a marked squint had suddenly developed at school. She returned home with the *left* eye shut and the face screwed up. The mother had died early in March, and, the father having need of a holiday, it had just been decided that the child should be a boarder at the school for a time. The child tends to pick up things with her left hand. She has one brother, aged 15, who is reported to be "short-sighted" in one eye. The father has a slight stammer. He has three brothers, of whom the youngest stammers badly and has squinted, and three sisters who are normal.

Fear as a Cause of Squint.

Fear seems to be a potent cause of squint. I have seen many cases resulting from falls and blows, where it seemed justifiable to rule out the possibility of physical injury to the eye or anatomical nervous system.

A small boy had had a right convergent squint for a fortnight. Two weeks before its appearance he had bumped against another boy, whilst stealing out of the house in his night clothes, unknown to his mother, to buy sweets. He received a "black eye" on the right side, and was so thoroughly frightened, according to the mother (although he admitted it very reluctantly) that he screamed for two hours. He had suffered from twitching of the body and especially of the head for six months, and was very restless, indeed almost choreic, when seen at my clinic. The squint, which had certainly not been present before the accident, disappeared, but the restless movements continued. He cried much, was afraid of the dark, developed violent headaches and photophobia, and it was obvious that the mental shock had been severe. The family history revealed that of his two sisters one, aged 12, was "backward and dull and always ill," the other, aged 6, was attending the clinic with inflamed eyes, and the only brother, aged 11, was suffering from "nerves and heart and bad stammering." The father stammered, and the mother was left-handed.

I would draw particular attention to the occurrence of choreic movements in this instance. They have been present either in the patient or the family so frequently that I have thought it worth while to inquire, as a routine procedure, into their incidence, with the result that a number of cases showing their occurrence in squinting families has been collected.

One boy who came for treatment of occasional left squint developed a very pronounced twitching of the left side of face and body, following the application of atropine to the eyes. He became rapidly worse, and the twitching was soon so severe that the doctor diagnosed meningitis. The squint became permanent and greater in degree during the illness. The boy had two sisters, who were normal. The mother had four brothers, one of whom squinted, and six sisters, of whom the eldest was left-handed. It should be added that the father "suffered terribly from neurasthenia, and sometimes was not quite rational," after being in action at the Jutland battle.

It may be suggested that the onset of the chorea merely coincided with the use of the atropine. In favour of the possibility of an emotional factor being present, however, I would point to the cases, of which I have seen several, in which permanent squint has followed as a direct consequence of instilling atropine into the eyes of nervous children. One is apt to forget that the dread of interference with their eyes frequently shown by children is instinctive and not subject to reason. Indeed it is not unusual to find adults who cannot control their fear of the most gentle manipulation of their eyes, and who display the greatest dread of "going blind," although only temporarily, from the application of a mydriatic. The failure of accommodation, possibly associated with a fear corresponding to that of the strong man who faints when he is vaccinated, seems to be sufficient to cause serious disorganisation of the neuro-muscular function.

The influence of fear may be an explanation of the development of squint after whooping-cough, in which the paroxysmal attacks of asphyxiation must have a terrifying effect. I offer the same explanation to account for certain cases of squint following upon operations for tonsils and adenoids. An instance of this is a boy who had a right convergent strabismus after operation. At first inconstant, it became permanent. The boy's mother is left-handed.

Mirror-writing.

The tendency to mirror-writing in left-handers is so well known that it needs only a reference. A more uncommon attribute occurring in a left-hander is indicated in the case of a boy who was referred to me because he saw double. The natural inference was that he was developing squint and consequent diplopia, but investigation showed that when copying from the blackboard he doubled the letters and figures thus—229977 *for* 297; *in fact*, he might almost be described as having a "stammering" eye. He was the youngest of six, of whom all but the first two were left-handed until the age of seven or eight, when they became right-handed. All these left-handers have tended to write backwards, mirror fashion.

It happened that whilst I was engaged in investigating histories such as these, Dr. W. C. Rivers, tuberculosis officer of the Barnsley district, published an article in THE LANCET of Feb. 12th, 1921, in which he recorded cases where the whole family was exposed to infection, and only the left-handed members became tuberculous. He also noted that squint is two or three times as common in consumptives as in the general population. This widens the field of research almost illimitably. It would seem as if the squinter and left-hander had spent themselves under stresses the intensity of which cannot at present be estimated, and thereby rendered themselves more liable to infection, since it is impossible to conceive that left-handedness is itself a sign of deficient vitality. In other words, the connecting link between left-handedness, squint, and pulmonary tuberculosis will probably be found in the mental make-up of the individual rather than in his physical constitution.

This may seem a wild suggestion, yet a parallel may be found in the discussion on rheumatoid arthritis at the Royal Society of Medicine (Proceedings, November, 1923), when stress was laid upon the fact that the onset of the disease frequently coincided with some painful emotional experience. It is only fair to add, however, that so eminent an authority as Dr. Ernest Jones states in a verbal communication that after two years' psycho-analytical investigation of left-handedness he was unable to find a psychological factor in its development.

Conclusion.

The moral of the story seems to be two-fold: first, that these conditions, hitherto regarded as separate and unrelated, appear to be determined by defects in the personality as a whole, and secondly, that the emotional difficulties of the child in meeting social demands have an importance which has till now been hidden from all save the psycho-analyst.

PROBLEMS IN CONNEXION WITH THE DEBILITATED CHILD.

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PROBLEMS in connexion with the debilitated states of childhood are continually being forced on the notice of those engaged in the care and treatment of sick children. A large proportion of the cases attending a children's out-patient department is made up of debilitated children with no gross physical signs. Whilst the reasons for their visits to the doctor vary, and whilst the children show differences in their histories and symptoms, yet analysis demonstrates the great frequency of certain main characteristics, and leads one to believe that there are important factors at work in the production of these debilitated states that are common to the majority of the cases. The importance of the recognition of these factors cannot be over-estimated, seeing the large amount of defective health found amongst children of school age, and the great possibility that from this arise certain more clearly defined conditions, of which rheumatism, chronic nervousness with its numerous manifestations, and tuberculosis may be mentioned as the more important.

Analysis of Histories, Symptoms, and Physical Abnormalities of Debilitated Children.

An examination of the histories of these children demonstrates the frequency of certain main symptoms. In the majority there is a history of wasting or refusal to gain weight, the development of an anæmic appearance, listless attacks, complaints of feeling the cold and being easily tired, indefinite pains about the limbs, and in some cases a history of "faints," giddiness, and pallor. Chronic digestive disorder is suggested by the frequent history of lost or capricious appetite, indefinite abdominal pain, chronic constipation, bilious attacks, and mucus and thread worms in the stools. A large proportion of these children are described as being nervous, timid, excitable, fidgety, and restless; and bed-wetting, nocturnal restlessness, night terrors, and the development of certain habits of movement are complained of in some of the cases. The actual combination of symptoms varies from case to case; it is, however, remarkable how frequently refusal to gain weight, loss of appetite, constipation, and nervousness occur together.

Clinical examination likewise reveals the frequency with which certain physical abnormalities are found. Most of the children are under weight and in poor physical health. They are pale and sallow, some have dark rings under the eyes, and occasionally the skin pigment is increased. There is a general want of tone in all the systems, but specially is this true of the muscular system and of the mucous surfaces. In the upright position there is an exaggeration of the natural curves of the body. Lordosis may be marked, and there is compensatory stooping of the shoulders with winging of the scapulæ. The abdomen is pushed forward with an appearance of enlargement when viewed from the front. In a considerable number of cases the abdomen actually is enlarged, often in striking contrast to the poorly covered chest wall. The abdominal fullness is due to two factors—namely, the tonelessness of the abdominal muscles, and the atonic distension of the bowel within. In many cases there is evidence of an unhealthy naso-pharynx, with or without enlargement of the tonsils and adenoid tissue. The deep sets of glands in the posterior triangles of the neck are enlarged and "shotty," and the glands in the axillæ, and to a less extent in the groins, are more palpable than those of the healthy child. There appears to be a generalised hyperplasia of the lymphatic glands, those, however, of the neck being specially prominent. A proportion although when tested he obviously wrote better with his right hand, and admitted that it was easier than with the left, he always used the latter for writing at home.

Nature of Emotion Influencing Squint.—As a rule the nature of the excitement influencing squint is not examined by the parents, and it is difficult for the surgeon to do more than surmise as to what is passing in the child's mind.

I have seen a little girl who squinted when she sat on my knee, and faced the father (of whom the child was afraid, according to the mother's account), and yet had straight eyes when she sat on her father's knee and, facing me, accepted my friendly overtures. Another child with a squint, restless in her mother's arms, and afraid of my approaches, lost the deviation when I tickled her and made her laugh. Yet another, with 6D hypermetropia in each eye, was brought to me with a history of a squint which, however, could not be evoked even when she was without her glasses, but appeared at once when I asked her to look at her mother and be scolded, the latter having previously told me that a reprimand often upset the balance of the eyes. The same result occurred in two boys of about 10, who had recently had operations for convergent squint. The resultant parallelism had been demonstrated to another observer who was sceptical of the theory here propounded. I suddenly spoke to the boys in a loud threatening voice, and both of them immediately relapsed into a bad squint, which slowly disappeared when they realised that I had been playing a trick upon them.

A suggestive example is that of a boy of 8, whose squint dates from a fit when 6 months old. The squint is never constant, but appears only when he is nervous—e.g., when meeting strangers. He was left-handed when a baby, but was checked. He has always ridden his scooter left-footed. He has only one brother, aged 17, who stammered when a child. The father's father squinted. It will be noticed that although the left-handedness has been eradicated, he still clings to left-footedness.

A similar emotional cause may be at work in these cases, as in a left-handed girl of 7, who was referred to me because she complained that large letters on the blackboard looked small, and vice versa. She was described as being very determined and independent. She had one brother who stammered occasionally. She confided to me that the ocular phenomenon, which lasted only one week, was due to jealousy, her little girl friend having chosen someone else to play with. In her own words, "she did not want to see things right."

The following case tends to confirm the opinion that deep-seated emotional reactions may be connected with the development and persistence of squint.

I have under my care at the present time a little girl of 2½, who developed a squint at the age of 2. The curious thing about this squint was its regular appearance and disappearance on alternate days. If she squinted on Sunday, she did not on Monday, and so on. Cases have been reported of children who wrote on some days with the left hand, and on other days with the right. The only explanation which the mother could offer was her practice of keeping the children at home every other day, whilst she worked long and hard in order to be free to take them out of doors for a long spell the next day. On one occasion she reported to me that the father had been unwell, and had stayed in bed for the day. The little girl as a treat was allowed to have breakfast in bed with Daddy. It was her "squinting" day. The father whispered to the mother that there was no squint, and during the whole time in bed none developed. When, however, the mother came to fetch her away, the squint appeared, and persisted throughout the day, "according to plan."

The reactions of a child who developed a squint at a later age afford a better opportunity of studying possible emotional causes of the deviation.

A little girl of 6 began squinting during a fit of coughing, in June, 1919. The eyes became normal in the following months, but the squint recurred in the winter, and in February, 1920, she was taken to an oculist who prescribed R. and L. +1·5 sph. At that time she was seeing double. She was brought to me in August, 1921, when I found normal vision in each eye and 8° esophoria. Diplopia could be easily induced, fusion being obtained when the object was 1 metre distant. In the following winter she had whooping-cough, and it was noticed that after a fit of coughing a definite squint was present. As the effort to overcome 1·5D hypermetropia could have little effect in throwing the eyes off their balance, I advised that the glasses should be discarded. In August, 1922, she was again examined, and the esophoria now varied from 8° to 12° or more. She had previously told her father that she was anxious for the squint to be worse, as she particularly wished to wear glasses in order to be like her mother and brother. Occasional diplopia was complained of. At the next visit, in February, 1923, it was reported that although she had not worn glasses for over 12 months, she had been quite comfortable and without squint until two days previously, when the right eye had deviated inwards momentarily. On the following day she suddenly squinted badly with the right eye during a grammar lesson at school. The mistress told her not to squint, and she immediately began to see double. I inquired closely into the possibility of a sudden strain upon the accommodation at the time of onset of the squint, but found that the child had been quietly listening to a lecture by the mistress. When I asked what special part of the subject was being dealt with, the child replied "genders." She was described to me as of an exceptionally jealous disposition, and there had been trouble in the home when the father returned after several years' absence in the war, owing to her wish to monopolise the attentions of the mother. In February the mother was dying of cancer, and the domestic arrangements required that the little girl should sleep with the father. When she came for examination in March she entered my room without a trace of squint, but when attention was paid to her the right eye deviated inwards. She now gave the impression of being a precocious child. She was seen again in May, 1923. No squint had been noticed for some weeks, although she was still without glasses, until the morning of the consultation, when a marked squint had suddenly developed at school. She returned home with the *left* eye shut and the face screwed up. The mother had died early in March, and, the father having need of a holiday, it had just been decided that the child should be a boarder at the school for a time. The child tends to pick up things with her left hand. She has one brother, aged 15, who is reported to be "short-sighted" in one eye. The father has a slight stammer. He has three brothers, of whom the youngest stammers badly and has squinted, and three sisters who are normal.

Fear as a Cause of Squint.

Fear seems to be a potent cause of squint. I have seen many cases resulting from falls and blows, where it seemed justifiable to rule out the possibility of physical injury to the eye or anatomical nervous system.

A small boy had had a right convergent squint for a fortnight. Two weeks before its appearance he had bumped against another boy, whilst stealing out of the house in his night clothes, unknown to his mother, to buy sweets. He received a "black eye" on the right side, and was so thoroughly frightened, according to the mother (although he admitted it very reluctantly) that he screamed for two hours. He had suffered from twitching of the body and especially of the head for six months, and was very restless, indeed almost choreic, when seen at my clinic. The squint, which had certainly not been present before the accident, disappeared, but the restless movements continued. He cried much, was afraid of the dark, developed violent headaches and photophobia, and it was obvious that the mental shock had been severe. The family history revealed that of his two sisters one, aged 12, was "backward and dull and always ill," the other, aged 6, was attending the clinic with inflamed eyes, and the only brother, aged 11, was suffering from "nerves and heart and bad stammering." The father stammered, and the mother was left-handed.

I would draw particular attention to the occurrence of choreic movements in this instance. They have been present either in the patient or the family so frequently that I have thought it worth while to inquire, as a routine procedure, into their incidence, with the result that a number of cases showing their occurrence in squinting families has been collected.

One boy who came for treatment of occasional left squint developed a very pronounced twitching of the left side of face and body, following the application of atropine to the eyes. He became rapidly worse, and the twitching was soon so severe that the doctor diagnosed meningitis. The squint became permanent and greater in degree during the illness. The boy had two sisters, who were normal. The mother had four brothers, one of whom squinted, and six sisters, of whom the eldest was left-handed. It should be added that the father "suffered terribly from neurasthenia, and sometimes was not quite rational," after being in action at the Jutland battle.

I would insist that tubercle, sufficient of itself to cause wasting, must be extensive, and its toxin must reach the tissue cell in considerable amount. If the tubercle is extensive enough to produce wasting at this age-period, the chances of recovery are poor, and the clinical signs of its existence should be present. That a considerable proportion of these children—about 60 per cent. of my own cases—give a positive tuberculin reaction I agree, and that a minority of the cases actually have local tubercular lesions of some group of glands I do not deny, but that the debility and health defect are due to tuberculosis in a large proportion of the cases I do not believe. To my mind, the tubercular lesion, if present, is more likely the result of the health defect than the cause of it. With reference to the incidence of tubercular lesions at this age-period, the following figures obtained from the post-mortem notes at the Leeds General Infirmary are of interest. During a period of 10 years, 563 children between the ages 5 and 15 were examined. 185 (32·8 per cent.) had tubercular lesions; excluding the cases where death had been directly due to tubercle, 86 (18·6 per cent.) had localised tubercular lesions, and of a series of 103 cases where death had been caused by accidents, 14 (13·5 per cent.) had local lesions.

In a considerable number of the cases the lesion merely consisted of one or two old calcified glands, and these figures are given to combat the statement that large numbers of school-children are suffering with tuberculosis or are harbouring local tubercular lesions.

It is, of course, important to be able to say whether tubercle is or is not present, and whether it is located in the mediastinal or abdominal glands, but clinical signs and tests are consistently unsatisfactory and a definite answer is often almost impossible. The important fact is to realise that the child's debility is due in the large majority of cases to factors not related to tubercle, and to treat accordingly.

Relationship of the Debilitated State with Nervous Instability.

Nervous affections are common amongst all classes of children, but specially is nervous instability and unrest found amongst debilitated children. The modern tendency appears to be to find explanation for nervous manifestations in mental processes, and to emphasise very forcibly the primary importance of the psychological factors. One is continually being forced to the conclusion that the majority of nervous children present clinical features that are impossible to explain by looking at the case from the psychological standpoint; and, in fact, it appears to me to be far easier to explain the nervous unrest and abnormal mental states as being in most cases secondary to physical ill-health.

In the histories of debilitated children evidence of nervousness in one way or another is consistently found. Timidity, fidgety states, habit spasm, nocturnal enuresis, night terrors, and peculiar likes and dislikes occur with considerable frequency, and can be explained by a combination of the nutritional defect, in which the nerve tissue is bound to partake, and the toxic factor, which produces a continuous irritation of the nerve cell. In the care and treatment of the child with inherited nervous instability the psychological factors in the production of nervous disorder are of first importance and cannot be neglected, nor can their importance be underrated in the treatment of the far larger number of nervous children belonging to the toxic debilitated class; but it has been my experience again and again to find that to under-estimate the meaning and importance of the physical abnormalities of this larger class is to miss the shortest way that will lead to a return to mental health.

Relationship of Rheumatic Affections of Childhood to the Debilitated State.

Important evidence in favour of a toxic factor as an explanation of many of the physical and nervous abnormalities of the debilitated child is provided by the relationship between the rheumatic and the debilitated state. The relationship between nervous disorders and chronic intestinal dyspepsia, on the one hand, and nervous troubles and rheumatism, on the other, has been stressed in the past. The nervous manifestations of both groups are practically identical. An examination of the histories of 100 consecutive cases of frank rheumatism and rheumatic heart disease in children showed in 82 of the cases definite evidence of ill-health preceding the first manifestation of rheumatism, and an analysis of symptoms of the disturbed health demonstrated the great frequency of wasting or refusal to gain weight, loss of appetite, constipation, anæmia, nervousness, headache, indefinite limb pains, tired feeling, and chronic cough. In 46 of the cases certain evidence of bowel catarrh previous to the first rheumatic attack was forthcoming, in 14 cases there was a long history of lost appetite and constipation, while in a further 12 cases evidence of bowel catarrh was found by an examination of the stools at the time of the active rheumatism. In 58 cases, therefore, certain evidence of bowel catarrh was obtainable, and if loss of appetite with constipation be accepted as evidence of chronic dyspepsia, then in 72 per cent. of the cases it was proved to be present, either before the first attack of frank rheumatism or at the time the child was under treatment for the rheumatism. The pre-rheumatic histories of 65 of the cases gave evidence of chronic nervous unrest. In only 10 cases was there a history of "sore-throat" preceding the first attack of rheumatism, although 37 of the children had enlarged tonsils at the time of examination and 15 of the cases had had their tonsils and adenoids removed at some previous date.

The following is a detailed analysis of the symptoms and abnormalities (other than those of the rheumatic infection) of 100 cases of rheumatism, and in order to compare the symptoms and abnormalities of the debilitated class an analysis of 100 cases, not specially chosen, belonging to this class is also given. It will be noticed that the figures for rheumatic cases are generally lower than those for the other class. This is partly due to the fact that in the earlier cases information as to many of the symptoms and abnormalities was not obtained, as neither the possible importance of the child's history during the years preceding the rheumatism, nor the likely relationship between the debilitated and the rheumatic child was then realised.

Comparative Analysis of (A) 100 Rheumatic Cases and (B) 100 Debilitated Cases.

Symptoms and abnormalities.	No. of times occurring amongst—		Symptoms and abnormalities.	No. of times occurring amongst—	
	(A)	(B)		(A)	(B)
"Wasting or not getting on" ..	36	40	Loss of appetite ..	45	59
Definitely under weight	45	54	Excessive appetite	11	8
Pallor	59	64	Abdominal pain ..	15	26
"Nervousness" ..	63	81	Constipation ..	46	47
Nocturnal enuresis	11	22	Loose stools ..	8	11
Night terrors ..	12	12	Mucus in stools ..	44	57
Habit spasm ..	5	13	Thread-worms ..	29	46
Limb pains	61	39	Catarrhal chest ..	13	15
"Always tired" ..	19	36	Dilated irritable heart	14	17
Listlessness	17	15	Palpable glands, neck, and axillæ	42	64
Headaches	17	21	Tonsils and adenoids ..	37	44
Bilious attacks ..	8	9			

By the term "frank rheumatism" is implied chorea, definite synovitis, with swelling of the joint, and rheumatic heart affection (permanent valvular lesion, pericarditis). The rheumatic manifestations were distributed as follows: Chorea alone, 31 cases; chorea and synovitis, 8; synovitis alone, 18; chorea and heart disease, 11; chorea, synovitis, and heart affection, 6; synovitis and heart affection, 21; heart lesion only, 5. The pre-rheumatic disturbed health of some 82 of these cases appears to differ in no way of the cases have quick irritable hearts, and the apex beat in a minority of the children is found to be outside the nipple line. There is often a short, frequent cough, occurring specially at night, and catarrhal sounds are not infrequently found in the chest. Timidity, restlessness, and occasionally habit spasm are noticed during the examination. As in symptoms, so in physical abnormalities, the combination varies from case to case, although deficient weight, toneless muscle, enlarged glands, and nervous unrest are found to occur together with monotonous frequency.

Possible Ætiological Factors in Production of Debilitated States.

Can the child's debility be explained by its environment? The fact that most of these cases are of the hospital class suggests at once that we are dealing with a condition engendered by defective hygienic surroundings; but that the environment is rather an intensifying than the chief factor is proved by the fact that typical examples are found amongst children of well-to-do parents living under the best conditions. If it can be shown that the child's diet is an important factor in the production of the debilitated state, then it is easily understood that the hospital child is more likely to suffer than the child of more fortunate parents.

It would appear to me that there are two chief causes at work, the one nutritional and the other toxic. The general tonelessness of the child and the relaxed mucous surfaces suggest at once a deficient nutrition of the tissue cell. That this is not due to insufficient food is proved by the inability of the parent to fatten the child by increasing its food, and the child's refusal to gain weight even when the appetite is excessive and food is taken freely. An increase in the daily quantity of milk is usually unsuccessful unless the child has been deliberately underfed, a condition of affairs which in my experience is quite exceptional. In the majority of hospital cases the parent is only too willing to give as much food, although unsuitable, as the child will take. The difficulty is that it so frequently has no appetite. I would suggest that the tissue cell defect is due to the cell being supplied over a long period of time with nutriment insufficient in some essential constituent or constituents, or a diet ill-balanced in its constituents, and later there arise from this a reduction and impairment in the secretory and absorptive powers of the bowel, due partly to the general tonelessness in which it also partakes and partly to a chronic catarrhal state set up by the prolonged unsuitability of the diet in the direction of gross relative excess in starches and sugar.

After the weaning period the majority of children are given a diet which, while sufficient in total calories, is overweighted with carbohydrate. The diet either contains too little animal protein and fat, or the relative excess of carbohydrate produces effects which render the other parts of the diet less useful. The diet of the present-day child, and specially the child of the hospital class, largely consists of bread, rusk, biscuit, potato, rice, sago, and other cereal, together with a quantity of sugar far in excess of its needs. The eating of sweets adds still more to the carbohydrate of the diet. With such a diet over a period of months or years, the tissue cell is bound to suffer, and it is to this that I would suggest a good deal of the child's tonelessness is due.

Many of the symptoms are difficult to explain except on the basis of a toxæmia. The headaches, the indefinite pains about the limbs, the colour of the skin, the listless attacks, the nervous instability and unrest, and the extensive glandular hyperplasia are all in favour of a prolonged toxic irritation. There are three places from which a toxin is likely to be absorbed—the bowel, the throat, and the urinary tract. In a considerable number of cases the naso-pharynx is unhealthy in the sense that the mucous membrane is relaxed, chronically inflamed, or the tonsils and adenoid tissue enlarged. As Dr. Lapage[1] has pointed out, hypertrophy of the tonsils and adenoid tissue need not necessarily be present when the naso-pharynx is unhealthy. The frequency with which the posterior cervical glands are enlarged suggests chronic absorption from the throat, although the increased palpability of the axillary glands tends to show that the toxic irritation of the lymphatic system is more generalised. Be this as it may, there can be no doubt that the throat is frequently a source of added toxæmia, specially in those cases with marked nervous unrest, and also, I think, in the cases with quick irritable hearts, to which Dr. Lapage has previously drawn attention.

In the care and treatment of these debilitated children, one is forced to the conclusion that most, if not all, are suffering from a persistently impaired digestion, due partly to the tissue cell defect already mentioned, but more especially to a chronic dyspepsia of the nature of a chronic mucous catarrh. In a good many cases there is clear evidence of this—the symptoms and the condition of the stools point to it. In a considerable minority there appears to be no direct evidence of dyspepsia, although there is frequently a history of prolonged constipation. Parents do not usually see their children's stools after infancy, and are willing to believe the child's bowel is working normally if on the child's evidence it is moved once daily. Such cases I have frequently had under observation in the ward, and have found that by washing the stool through muslin considerable quantities of mucus are present. It is not easy to define the varying characteristics of normal stools of children over the age of infancy, but I would claim that the presence of much undigested food, masses of jelly, and visible liquid mucus intimately mixed with the stool are abnormal and evidence of a chronic catarrhal state of the bowel. Severe examples of this condition are, of course, instances of the mucous disease described by the late Dr. Eustace Smith.[2] The great frequency with which bowel disturbance and constipation are found appears strongly to favour the intestinal tract as an important and probably the most frequent source of toxic absorption, and the results of treatment support this supposition.

Probable Sequence of Events in Production of Debilitated State.

As has already been suggested, there is probably a gradual bringing about of a general tissue cell defect by a prolonged inefficiency of the diet, and the mucous surfaces and glands soon lose tone and resistive power. Infections are with difficulty resisted and organisms and their toxins reach the lymphatic glands. I strongly support the view that the fundamental cause of the unhealthy throat and the tonsillar and adenoid hypertrophy is dietetic, the local resistance being lowered in the way indicated. The effects of infection and toxic absorption are added to the child's symptoms; but here again I would emphasise the belief that the main source of toxic absorption is in the bowel. The child's debility is still further increased by impaired digestion, due to the catarrhal state of the bowel, its toneless condition, and the frequency of intestinal stasis. Vicious circles are thus formed and the power of resisting toxins is greatly lowered.

Relationship between the Debilitated State and Tuberculosis.

In discussing the debilitated child the question of tubercle cannot be ignored. The wasting and the frequency of cough and catarrhal signs in the chest suggest to the parents, and sometimes to the doctor, the possibility of tubercle. Many of these cases are said to be infected with tubercle, to be suffering with tubercle, or are labelled as children with a pre-tubercular condition. The evidence is extremely unconvincing, and from experience in dealing with these children I am strongly of opinion that the large majority are certainly not suffering with tuberculosis.

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[1] Brit. Med. Jour., July 2nd, 1921.

[2] The Wasting Diseases of Infancy and Childhood, 1870.

I would insist that tubercle, sufficient of itself to cause wasting, must be extensive, and its toxin must reach the tissue cell in considerable amount. If the tubercle is extensive enough to produce wasting at this age-period, the chances of recovery are poor, and the clinical signs of its existence should be present. That a considerable proportion of these children—about 60 per cent. of my own cases—give a positive tuberculin reaction I agree, and that a minority of the cases actually have local tubercular lesions of some group of glands I do not deny, but that the debility and health defect are due to tuberculosis in a large proportion of the cases I do not believe. To my mind, the tubercular lesion, if present, is more likely the result of the health defect than the cause of it. With reference to the incidence of tubercular lesions at this age-period, the following figures obtained from the post-mortem notes at the Leeds General Infirmary are of interest. During a period of 10 years, 563 children between the ages 5 and 15 were examined. 185 (32·8 per cent.) had tubercular lesions; excluding the cases where death had been directly due to tubercle, 86 (18·6 per cent.) had localised tubercular lesions, and of a series of 103 cases where death had been caused by accidents, 14 (13·5 per cent.) had local lesions.

In a considerable number of the cases the lesion merely consisted of one or two old calcified glands, and these figures are given to combat the statement that large numbers of school-children are suffering with tuberculosis or are harbouring local tubercular lesions.

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Headaches	17	21	Tonsils and adenoids ..	37	44
Bilious attacks ..	8	9			

By the term "frank rheumatism" is implied chorea, definite synovitis, with swelling of the joint, and rheumatic heart affection (permanent valvular lesion, pericarditis). The rheumatic manifestations were distributed as follows: Chorea alone, 31 cases; chorea and synovitis, 8; synovitis alone, 18; chorea and heart disease, 11; chorea, synovitis, and heart affection, 6; synovitis and heart affection, 21; heart lesion only, 5. The pre-rheumatic disturbed health of some 82 of these cases appears to differ *in no way* from the manifestations of defective health found in the debilitated child, and in my opinion rheumatism is an infection developing in this type of child. It is of interest to mention that eight of the above rheumatic cases developed their first rheumatic attack during the time they were under treatment for chronic catarrh of the bowel, 4 cases; nervousness and habit spasm, 1; chronic constipation, loss of appetite, and nervous debility, 2; bilious attacks, nervousness, and wasting, 1.

Rheumatism in the child is an extremely insidious disease, and does not in the majority of cases behave at all like the usual type of infectious disorder. Its beginning is often difficult to define, relapses are common, it may smoulder for years, and occasionally the disease flares up dangerously and the child is placed in immediate jeopardy. A valvular lesion may develop without any preceding history of a frank rheumatic attack, as happened in five of my cases.

Since the research work of Poynton and Paine,[3] it has been accepted by all that rheumatism is due to an infection with an organism belonging to the streptococcal group of bacteria, although its exact type has still to be clearly defined, and such a conception of the ætiology of the disease fits in well with its clinical manifestations. It would seem as if the child harbours the rheumatic organism, which every now and then overcomes local resistance, and an attack of rheumatism occurs. Possibly at times only the toxin is at work, while at others the organism gains entrance to the tissues, or it may be that the pre-rheumatic disturbance in health is due to the toxin, and the rheumatism itself to the passage of the organism into the tissues.

The conception of the disease which I desire to put forward is that rheumatism is in most cases the result of a series of events which began some months or years earlier, and that the rheumatic stage has followed a stage of debilitated health during which a toxæmia has been in existence. "Growing pains" and fleeting indefinite pains about the limbs occur with great frequency amongst debilitated children, and can hardly be explained but by the influence of some toxic agent. The frequency with which a dilated irritable heart is found in the child with toxic debility and the acknowledged frequency with which the same type of heart is found in frank rheumatic infection may also be mentioned. It has always been held that the rheumatic toxin is specially liable to influence the cardiac muscle, apart altogether from any permanent affection, and I would suggest that the toxic rheumatic heart which rights itself after the rheumatic attack has come to an end is merely an exaggeration of the toxic irritable heart of some debilitated children.

Whether the rheumatic organism and its toxin enters the body via the naso-pharynx or the bowel must remain for the present undecided, although one would like to point out again that "tonsillitis" is by no means a very frequent accompaniment of rheumatism—at least it was not so in my series of cases—while, on the other hand, evidence of disturbed bowel occurs with great frequency both in the histories of debilitated children and in the pre-rheumatic history of the frankly rheumatic child. That the state of the bowel is the more important cause of debility is, in my experience, brought out by the results of treatment in this direction. Amongst my own cases the removal of tonsils and adenoids did not, in the majority of cases, produce any marked change, nor has the operation appeared to save some rheumatic cases from their rheumatism, for certainly 15 of these developed their rheumatism subsequent to the operation. On the other hand, treatment by strict dieting, persistent avoidance of constipation, and "bitter alkali rhubarb" mixtures produces in most cases a very marked improvement in a few months. I am in the habit of treating a debilitated child in this way even although I find no evidence of bowel catarrh, because the results are always strikingly better than those obtained by ordering extra milk, iron, cod-liver oil, &c., and lead me to believe that even in these cases the bowel is at fault, although there is no evidence of defect. From this it naturally follows that in the prophylaxis of rheumatism and a large amount of heart disease of young people, the control of the child's health—and particularly the provision of a well-balanced diet —during the years immediately following weaning are of the first importance.

Summary.

Problems in connexion with the debilitated child are discussed. The histories and physical abnormalities of these children are examined, and the frequency with which the same type of sign and symptom occurs is pointed out. It is suggested that the signs and symptoms are due to two main factors, the one nutritional and the other toxic, the child's tonelessness being due to the former and many of the symptoms to the latter. The nutritional factor is said to be due to a long-standing dietetic defect, together with the results of a chronic intestinal dyspepsia, while the toxic factor is believed to be due to the absorption of toxins from the throat and bowel, emphasis, however, being placed on the latter as the probably more important source. It is suggested that the unhealthy throat is secondary to the general tissue cell defect brought by the nutritional factor.

The relationship of tuberculosis, nervous disorder, and rheumatism to the debilitated state is examined. That the debility of these children is in the large majority of cases not due to tubercle is insisted upon, although the possibility of strictly localised tuberculous infection in some group of glands cannot be altogether denied. It is believed that in cases in which such an infection exists that the infection is secondary to the preceding lowering of resistance and tone.

A plea is put forward that the nervousness and nervous disorders of these children is secondary to the nutritional defect of the nerve cell and its irritation by toxins. Evidence is given to show that the rheumatic infection of childhood is in most cases ingrafted upon a preceding defect in health, which on analysis proves to be similar to the defects in health shown by the debilitated child, and it is suggested that in the prophylaxis and control of the rheumatic diseases the child's health in its earliest years is of the first importance, and emphasis is again laid upon the great importance of a well-balanced diet and the avoidance of chronic intestinal dyspepsia.

THE PHOSPHATE RATIO IN MENTAL DISEASE.

BY WILLIAM MOODIE, M.D. ST. AND.,
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DEPUTY MEDICAL SUPERINTENDENT, HORTON MENTAL HOSPITAL, EPSOM;

AND

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CLINICAL ASSISTANT TO THE HOSPITAL.

THE investigations which form the basis of the following notes were prompted by some significant results obtained during the application of Sellards's alkali retention test[1] to a series of acute confusional mental cases of probably toxic origin. The mental state of many of these patients bears a marked resemblance to that observed in diabetes and other conditions of which acidosis is a feature; and it was seen, after only a small number of tests had been made, that there was frequently an abnormal alkali retention in confusional cases. The difficulty of administering exact quantities of alkali and of collecting specimens of urine at fixed times rendered it necessary, when dealing with mental patients, to simplify the procedure as far as possible from the patients' point of view, and, consequently, Sellards's method eventually gave place to a simple phosphate ratio estimation, using a standard technique.

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[3] Researches on Rheumatism, 1913.

[1] Sellards: Bulletin Johns Hopkins Hospital, 1912, xxiii., 289.

In a most excellent "Study in Diabetic Acidosis," Calvert, Mayrs, and Milroy[2] have shown that the phosphate ratio in the normal subject is measurably altered by 1 gramme of sodium bicarbonate, and that this alteration reaches its maximum about three hours after the ingestion of the alkali. The technique is simple. 10 c.cm. of urine are diluted with 40 c.cm. of distilled water. This is then titrated with N/10 NaOH, using phenolphthalein as indicator. A few drops of a solution of methyl orange are added, and the mixture is titrated with N/10 HCl. The quantity of N/10 NaOH required is called "A" and of N/10 HCl "B." The phosphate ration is $\frac{A}{B-A}$ and the result is expressed as a fraction of 10. At first considerable difficulty was experienced in judging the end-points of the titrations, but latterly two estimations were carried out simultaneously on the same sample of urine and the tints compared. This was found to simplify the matter greatly.

The investigation has not been confined to cases of the confusional type, but the test was later applied to all cases admitted, irrespective of their type. A very large number of cases of all forms of mental disease have now been examined, and the results arranged in two groups—those which react normally to a dose of alkali by a definite drop in the numerical phosphate ratio after three hours, and those in which the ratio is almost or quite unchanged. Many of these cases have been under observation for over a year after the index was taken, and their subsequent history has thrown much light on results which, at first, appeared contradictory and confusing.

Acute confusional cases which appear clinically to resemble acidosis conditions invariably show little change in the phosphate ratio after ingestion of the alkali, and repeated tests in any one case during the acute stage of the disease always give results of about the same numerical value. Several confused patients whose phosphate ratio dropped, as in the normal individual, proved from their subsequent history to be cases of paraphrenia, dementia præcox, or manic depressive insanity. There would appear from our results to be few, if any, exceptions to the statement that every pure case of toxic confusional insanity gives a positive "acidosis" reaction. These cases generally clear up rapidly and make a good recovery without showing any appreciable mental deterioration after convalescence.

There is no other definite mental condition in which an acidosis reaction is commonly found, but it is very often the accompaniment of excitement from whatever cause, and is almost invariably present in this condition. Pure manic-depressives do not, in our experience, appear to develop acidosis. We have found a stationary phosphate ratio fairly frequently in cases of general paralysis of the insane, but only late in the disease, and usually associated with excitement. The acidosis reaction does not appear to be a feature of dementia, and confused senile cases without an acidosis reaction have always, after observation, shown themselves to be cases of pure dementia.

Three main conclusions may be arrived at from an analysis of our results: (1) There is a definite type of confusional insanity which always shows the "acidosis reaction." This occurs at all ages, and the prognosis is usually good. (2) The numerical value of the phosphate ratio remains very constant for each case during the confused period. (3) An "acidosis reaction" is not uncommon in excited states, but this does not apply to manic-depressives.

The phosphate ratio may, therefore, prove to be a valuable aid to prognosis, and we venture to submit these preliminary results in the hope that others may take up the work and that in this way a large mass of data may be collected. Several methods of combating the acidosis as a therapeutic measure have been devised, but it is, as yet, too early to express any definite opinion as to their efficacy.

A CASE OF ENDOCARDITIS TREATED BY IMMUNO-TRANSFUSION

WITH APPARENT RECOVERY.

By E. WORDLEY, M.C., M.D. CAMB., M.R.C.P. LOND.,
PATHOLOGIST, SOUTH DEVON AND EAST CORNWALL HOSPITAL, PLYMOUTH.

IT is thought that a brief note on the following case will be of interest in view of the success of the treatment. The history is as follows:—

T. L., male, aged 37. He had pneumonia at 16 years, diphtheria at 20 years. In 1910, in Australia, he had an illness for which he was admitted to hospital. The symptoms were severe pains in the joints with general prostration, sweating, and fever. After three weeks in bed he was discharged. Almost immediately afterwards he again became ill with similar symptoms for two weeks. He was unable to get treatment at the time and states he took a considerable time to recover from the illness. In 1916 he joined the R.N.V.R. and served throughout the war, being able to carry out his duties perfectly. He was mostly in the Mediterranean area. During 1920, 1921, and 1922 he had several slight attacks of mild joint pains and slight fever. Each lasted about a week, but for all this period, except during these attacks, he was able to attend to business and to play games strenuously.

On Nov. 6th, 1923, he went to bed complaining of pains in the shoulders, wrists, and fingers; there was profuse sweating; the temperature was 102°F. He improved on treatment with salicylates and returned to work, though still feeling ill. On Dec. 20th he had to go to bed again. Sweating was again profuse. He had considerable fever, temperature rising to 102°–103° in the evening and dropping to almost normal in the morning. No abnormal physical signs had previously been noted, but there was now heard a reduplication of the first heart sound over the mitral area.

On Jan. 2nd, 1924, I saw the patient in consultation with Dr. B. B. Metcalfe, of Liskeard, Cornwall, to whom I am indebted for the clinical details and history and for permission to publish this note. A blood count showed leucocytes 6200 per c.mm., polymorphs 60 per cent., and lymphocytes 40 per cent. Agglutination reactions were done against the enteric and dysentery groups of organisms and also *M. melitensis* and *para-melitensis*, with negative results. A blood culture was sterile. The patient continued to have a high temperature. Rigors now occurred and he lost much weight. On Jan. 21st blood was again taken for culture and proved sterile. At this date numerous petechiæ were noted over the elbows, and later crops were seen over the arms and legs. His general condition was very bad. Frequent rigors occurred and the temperature was 103°–104° every evening. He was very weak. There was extreme pallor and some cyanosis, and he had wasted very considerably. The pulse was rapid and very feeble, and a soft murmur was noted following the first heart sound, and best heard over the mitral area.

Vaccine treatment in such desperate cases being so unsatisfactory, it was decided to try immuno-transfusion after the method described by Colebrook and Storer.[1] This first transfusion was given on Jan. 27th. Very briefly, the method is based on some observations of Sir Almroth Wright[2] [3] and his co-workers, who

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[2] Calvert, Mayrs, and T. H. Milroy: Journal of Pathology and Bacteriology, 1921, xxiv.

[1] Colebrook, L., and Storer, E. J.: THE LANCET, 1923, ii., 1341, 1394.

[2] Wright, Sir A.: Ibid., 1919, i., 489.

[3] Wright, Sir A., Colebrook, L., and Storer, E. J. Ibid., 1923, i., 365, 417, 473.

or of organic disease of the nervous system was found in no less than nineteen-twentieths of the cases. Physical sequelæ are more common in adults, mental in children below the age of 10. A long interval between the acute stage and the appearance of further symptoms is associated with a serious and progressive sequela. Symptomatic paralysis agitans, usually progressive, occurs in more than one quarter of the cases. The prognosis must be very guarded even when complete recovery appears to have taken place.

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The Importance of Being Understood.

A medical witness should carefully avoid conveying to judge and jury the impression that he thinks they know but little of medical matters; but at the same time he should not reckon on their having any sound knowledge on medical subjects. They may not be as ignorant as the coroner's jury which gave a verdict that a man had died from a stone in the kidney swallowed by him when lying in a state of intoxication on a gravel path, but it is best to guard against possibilities of profound ignorance or curiously absurd notions. Even if a medical witness is able to avoid technical terms, and to give his evidence clearly and accurately in ordinary language, there is still grave danger of serious misconception on the together with the full bibliography, have already made it essential to any worker in this still extremely controversial field.

In general arrangement the second edition does not differ from the first. As before, the book is divided into three parts: (1) The chief facts of normal colour-vision; (2) the chief facts of colour-blindness; and (3) the chief theories of colour-vision. The value of the second edition lies in the fact that the references have been brought completely up to date, and that all the important recent work on the subject has been incorporated. In particular, the inclusion of discussions on the later results of such scientists as Abney and Watson, Luckiesh, Pulfrich, and Ives may be mentioned. Additions naturally occur most frequently in Section I., and here many new curves and tables are found. Among others, the energy distribution curves of various illuminants, the work of Abney and Watson on threshold stimuli at the fovea, Luckiesh's method of study of the growth and decay of colour sensation by means of flicker, and Pulfrich's ingenious stereoscopic indicator for studying differences of brightness are well described. In the portion of the book devoted to theory there is little change, except for a more detailed discussion of Edridge-Green's views and the incorporation of Houston's vibratory theory.

ICARUS, OR THE FUTURE OF SCIENCE.

By **Bertrand Russell**. London: Kegan Paul, Trench, Trübner and Co. 1924. Pp. 64. 2*s.* 6*d.*

Mr. Haldane's "Dædalus" has roused a good many people, among them Mr. Russell, who here makes what is in some measure a reply to that bright *jeu d'esprit*, which, it will be remembered, imagines a prosperous future for human progress under the guidance of biological discovery. Mr. Russell puts on several belts as well as his braces, and draws a gloomy picture of the probable fate of men whom modern science has taught to fly. It is naturally less attractive and stimulating than the work of Mr. Haldane, who does not seem to care much what happens to his trousers so long as he gets forward. Pessimism always makes rather poor reading. Mr. Russell's main point is that the chief effect of science is to give men power to achieve their desires. He mistrusts man and doubts whether he will use his power wisely. In a few pages he covers a large field of great topics, and the treatment is necessarily brief and, indeed, does not amount to much more than a statement of the author's conclusions. The result will be disappointing to those who have been charmed and convinced by his more solid writing.

UROLOGY.

Modern Urology. Second edition. By many American Authors. Edited by **Hugh Cabot**, C.M.G., M.D., F.A.C.S., Dean and Professor of Surgery in the Medical School of the University of Michigan. Philadelphia and New York: Lea and Febiger. 1924. In two volumes. Pp. 828 and 744. $18.

This System of Urology, though written first only five years ago, has come to a second edition, partly because of its merits, but also because urology continues to make such progress that revision soon becomes a necessity. Certain changes are made in this edition, and to keep the size of the book within the same limits as before the historical sketch of genito-urinary surgery in America has been omitted. Two of the original contributors have died, and their work has been revised by others.

Hugh Cabot is to be congratulated on having collected together articles from so many pens, and at the same time produced a book which keeps the same high level throughout. There is some overlapping as in every System, and if space is urgently needed, as the preface suggests, there is plenty to be had by cutting duplicate descriptions. Of these the most prominent example is the perineal prostatectomy operation, which is described at great length by two authors, with numerous illustrations, most of which occur twice. But this is a small matter, and in no way detracts from the quality of the work. It is well written, very well illustrated, and has a bibliography at the end of each chapter. It should prove of great value to any surgeon who takes up urology as his special subject.

Kystoskopischer Atlas. Third edition. By **Erich Wossidlo**. Berlin and Leipsic: Wilhelm Engelmann. 1924. With 43 coloured plates. Pp. 111. 35 gold marks.

This third edition has been slightly altered in the text and somewhat rearranged. The collection of cystoscopic drawings in colour is really very fine, and for these alone the book is a welcome possession. The appearance of another edition so shortly after the second is evidence of the success of this atlas.

JOURNALS.

Brain. Vol. XLVII., Part 1.—The Pathogenesis of Cerebral Diplegia, by James Collier. This presidential address to the Neurological Section of the Royal Society of Medicine was printed in The Lancet of Nov. 24th, 1923. The thesis is maintained that true cerebral diplegia is the result of primary degeneration of the cerebral neurons. The causal agent is unknown except in certain rare cases of syphilitic infection.—On the Dissociation of Voluntary and Emotional Innervation in Facial Paresis of Central Origin, by G. H. Monrad-Krohn. A description of four cases showing acceleration and exaggeration of emotional movements of the face combined with voluntary paresis in the same distribution. This suggests that the emotional motor apparatus is distinct from the voluntary motor apparatus, and is normally subjected to a continuous inhibition by the latter. Further, the lenticular nucleus in its pallidal part probably contains the motor centre for emotional innervation.—The Pathological Anatomy of Disseminated Sclerosis, by C. P. Symonds. As the result of a thorough examination of a typical case which died during an acute exacerbation of the disease, the author is able to demonstrate the presence of perivascular infiltration with lymphocytes and plasma cells. He concludes that the disease is infective in origin, but he was unable to find spirochætes or other micro-organisms. The paper is well illustrated.—A Study of the Electromyograms of Voluntary Movement, by F. Golla. The muscular coördination taking place in voluntary movements was investigated by recording the muscle action-current and the muscle sound. It was found that in the coöperation between anatomically antagonistic muscles their time relations and the magnitude of their response is adjusted with an almost infinite variation to the different degrees of resistance that the voluntary movement may be called upon to overcome, or to the velocity with which it is performed. The effective mechanism of voluntary control appears to determine, in the first place, the nature, velocity, and force of any given voluntary movement, but plays no part in the determination of such modifications as may be necessary in the first instance to deal with the variations of the environment which may be encountered during the performance of the movement.—Electromyographic Studies of Experimental Convulsions, by Stanley Cobb. Thujone injections were used to produce convulsions in rabbits. The records obtained show that both the tonic and clonic parts of the fit are tetanic in character.—The Sequelæ of Encephalitis Lethargica, by A. G. Duncan. Of 136 consecutive cases 35 died; of the remainder, 83 were traced for at least 18 months after the onset of the disease. Evidence of mental impairment or of organic disease of the nervous system was found in no less than nineteen-twentieths of the cases. Physical sequelæ are more common in adults, mental in children below the age of 10. A long interval between the acute stage and the appearance of further symptoms is associated with a serious and progressive sequela. Symptomatic paralysis agitans, usually progressive, occurs in more than one quarter of the cases. The prognosis must be very guarded even when complete recovery appears to have taken place.

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A medical witness should carefully avoid conveying to judge and jury the impression that he thinks they know but little of medical matters; but at the same time he should not reckon on their having any sound knowledge on medical subjects. They may not be as ignorant as the coroner's jury which gave a verdict that a man had died from a stone in the kidney swallowed by him when lying in a state of intoxication on a gravel path, but it is best to guard against possibilities of profound ignorance or curiously absurd notions. Even if a medical witness is able to avoid technical terms, and to give his evidence clearly and accurately in ordinary language, there is still grave danger of serious misconception on the part of people whose medical knowledge is chiefly derived from quack advertisements, or other sources not more trustworthy than them. Where it is possible, a medical witness should provide himself with specimens, models, or pictures, which will make clear many points which no words would ever make intelligible. The details of a fracture of the wrist will be much better understood, for instance, if the medical witness can explain them with the help of articulated bones, and preferably ones showing a fracture similar to that which is under discussion.

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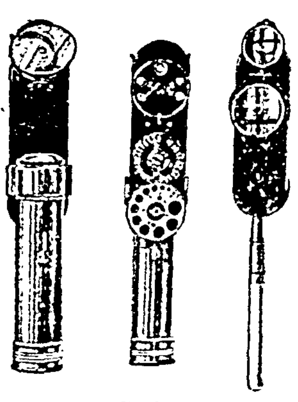

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The instrument has been made for me by the Aurorascope Co., Ltd., Fulwood House, Fulwood-place, Holborn, W.C. 1.

HENRY DUTCH, M.R.C.S.

THE LANCET.

LONDON: SATURDAY, AUGUST 2, 1924.

THE TEACHING OF HEALTH IN SCHOOLS.

AT a meeting of the Headmasters' Conference held in Winchester last year it was agreed that systematic teaching of hygiene ought to form part of the instruction of every boy during his time at school, and the Conference authorised the publication of a syllabus[1] which has been drawn up by medical experts for the benefit, in the first instance, of the members of the Conference this year. It is a guide for those who have to teach the theory and practice of healthy living to school-children of various ages and both sexes; and covering as it does a wide range, it is necessarily framed in general terms. In successive chapters the organisation of our public health service, housing, water, sewage, general biology and physiology, infectious diseases, exercise, fresh air, cleanliness, food, drink, and heredity are dealt with. The pamphlet concludes with a long list of books likely to prove useful to the teacher.

Education finds any justification it may need in the progressively increasing intelligence of successive generations. The boys and girls of to-day are, without doubt, quicker at learning than were their parallels of 20 and 40 years ago, and the reason of this is the greater independence which they enjoy, and, particularly, the better informed milieu in which they generally find themselves. But it is difficult to believe that they can possibly absorb a course such as is outlined in this syllabus, and we trust that headmasters and headmistresses will hesitate before suggesting that a valuable pamphlet should be used in any other way than as an indication to their staffs that practical health lessons can be conveyed in the course of the ordinary curriculum by teachers who are adequately informed. Pupils instructed directly from such a book as this would have a superficial, scrappy acquaintance with things they did not understand, and to import this serious disease of smattering, which is allowed by America to have affected their system of education, into seminaries of sound learning and religious education (such as still exist in this country) would be, we believe, a profound mistake from both the educational and hygienic points of view. No one questions the desirability of every young person having an elementary knowledge of human anatomy and physiology, of why one eats and what are useful foods, of what urine and fæces represent, of why it is well to wash, of the possibility of contracting some diseases by going too near other people who have them—and so forth. But to import into the school curriculum the pithy summary of the pathology of tuberculosis—admirable in itself—or the consideration of the results of mating allelomorphic pairs is verging on the absurd. We wonder, too, who is to teach up to this standard. We do not lose sight of the fact that the knowledge is to be imparted through the medium of the instructor, and after proper transmutation, but we wonder how many of our public schools, such as were represented at the Conference, possess the necessary staffs and equipment. The prefatory paragraphs of the syllabus rightly say that the teacher should be saturated with his subject. No good teaching, even of the most elementary kind, can, of course, be done otherwise, but a sound knowledge of the topics covered in the syllabus would imply the services of the experienced staff of a school of hygiene with a liberal idea of the confines of the subjects; such knowledge will scarcely be found among the staff of any ordinary—or, indeed, extraordinary—public school.

The document is framed on an impracticable scale. It starts with the proposition that "the science and art of healthy living . . . . is the most vital and human subject of the whole curriculum," which, if words are used in their common meanings, is either a patent extravagance or a sadly materialistic interpretation of the purpose of education. And if the scheme as outlined is to be carried through, it can only be by one of those illusory royal roads to learning which end in no sound permanent knowledge. The methods of healthy living, if they are to be of real use in later life, must be ground in with a thoroughness which makes them second nature, practised without deliberate thought, as the multiplication table is followed, and as the principle of asepsis is ground into medical students and surgical nurses. And in respect of health doctrines all that can possibly be imparted to the bulk of a school population would be the barest elements. Which is the more to be regretted, because the teaching of hygiene is a really important thing, and the ideal that all young citizens should start on the right road in the subject is one which is worth a great deal of trouble to achieve. The syllabus, we fear, would do little more than confirm the lay educationalist in the view, which he very likely holds already, that doctors are impracticable faddists.

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SQUINT, LEFT-HANDEDNESS AND STAMMER.

A RELATION has long been suspected between stammer and left-handedness, or mancinism, and on another page of this issue Dr. W. S. INMAN suggests that, with the addition of squint, they are alternative expressions of emotional states. It will be admitted that, in some people at least, stammer expresses emotion, and its appearance on specific occasions—in the presence of superiors, for example—must be regarded as a reaction of the whole personality. The patient himself is producing it, whether by contracting his diaphragm, closing his glottis, tightening his lips, or by other actions in themselves physiologically normal and capable of imitation by the non-stammerer. *Why* he does it is a question that our present knowledge allows us to answer only in terms of mental processes. But the case of mancinism seems very different, and the suggestion that it also may be of emotional significance will be new to most of us.

A letter which appears in our correspondence columns offers the generally accepted physiological explanation of mancinism and extends it to account for the onset of stammer after the successful restraint of the left-handed activities. The experiment reported by Mr. HUGH GORDON, and detailed by Dr. INMAN in his communication, seems also to support the view that, since speech depends upon the integrity of the left side of the brain in right-handed people and upon that of the right side in left-handers, the transfer of dominance from one hand to the other somehow involves the speech area of the cortex and causes a stammer. But a pure left-hander is rare, and, as Dr. INMAN shows, there is a notable specificity in left-handed activities. If these depend upon physiological causes, they demand a selective subtlety on the part of nerve cells which passes comprehension.

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[1] The Practice of Health. Winchester: Warren and Son. 1924. Pp. 6[illegible]. 1s.

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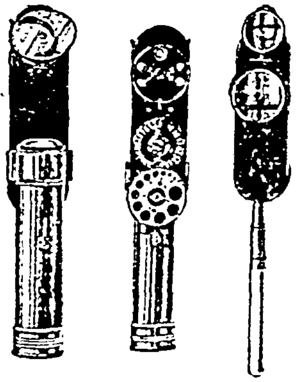
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HENRY DUTCH, M.R.C.S.

Council the decision as to whether certain conduct should or should not have occurred, and, having occurred, did or did not call for disciplinary interference.

With regard to the question of the appearance of names at the foot of letters or articles in the public press, the iniquity, according to Dr. H. B. BRACKENBURY, lies in the insertion of address, photograph, and titles; and here we are in entire agreement with Dr. E. R. FOTHERGILL, who in the course of the same debate asserted that some sort of coöperation is desirable with the lay press; for otherwise surely it is impossible to keep back information which is available on the reference shelf, or to avoid the portrait which is so easy to obtain without the victim's consent. It is idle to overlook the fact that in our impression of a personality not only is the name included, but the sound of the voice, the appearance of the features and gestures, and by laymen the withholding of everything but the name of the medical authority is regarded as a sort of professional snobbishness, difficult to understand, and apt to annoy. It may well be that we are passing through a temporary phase in regard to this form of advertisement, of which it is the newness that counts with the public, and that when the public becomes as used to it as it is to headlines and other developments or regressions in journalism, it will be able to assess the medical letter in the lay newspaper at its value. Perhaps more may be safely left to public opinion than those who are unduly anxious at the moment are inclined to admit.

Annotations.

"Ne quid nimis."

THE RESULTS OF TREATMENT IN SANATORIA.

THE results of hygienic-dietetic treatment as carried out in a well-run sanatorium are even more difficult to assess than those of any suggested specific remedy for pulmonary tuberculosis, for while the administration of a drug, the injection of a serum, or the inhalation of a gas can be tried out as the one variable factor in the general hygienic treatment of a community of invalids of approximately the same age and stage of disease, the sanatorium itself is essentially an institution where all the lessons derived from the sciences of pathology and hygiene, tempered by therapeutic experience, are combined and enforced. So universally approved is this basic routine of fresh air, rest, regulated diet, and exercise, that it is not easy to collect for purposes of comparison any body of individuals treated on radically different lines. Failing a control series of cases, the investigation undertaken at the request of the Medical Research Council by Sir Percival Horton-Smith Hartley, Dr. R. C. Wingfield, and Mr. J. H. R. Thompson, F.I.A., into the results of sanatorium treatment has taken the form of a careful study of the after-histories of those patients treated at the Brompton Hospital Sanatorium, Frimley, during the years 1905–14. The outcome of this study was issued last week in the form of a Green-book.[1]

The material under consideration consisted of 3400 patients, 2393 men and 1007 women, of whom only 10 per cent. defied all efforts to trace their present whereabouts or state of health. Incidentally, a survey of the occupation previously followed by these patients would at once suggest an open-air life as a desirable therapeutic measure, since the three largest groups in either sex were as follows: (Men) clerks, 399; shop assistants and salesmen, 158; porters (indoor), 98; (women) domestic servants, 216; housewives, 185; "at home," 118. The data on which the analysis was based is as shown in the table.

The mortality was determined according to condition on admission, according to condition on discharge, and again, according to the presence or absence of tubercle bacilli in the sputum; also in relation to the type of onset. Of the conclusions reached, the following are emphasised as of special importance. 1. The results of sanatorium treatment at Brompton Hospital correspond very closely with the results already reported from the King Edward VII. Sanatorium, Midhurst. They correspond, but not so closely, with those presented in Dr. H. Vallow's report from Bradford. 2. The mortality of patients without tubercle bacilli in the sputum is less than that of patients with tubercle bacilli in the sputum. The curves of survival among both males and females of those in the former category approximate to those of the general population. The authors deduce that enduring arrest of the disease is to be expected from sanatorium treatment in many early cases of the kind admitted to Frimley. 3. Of cases with tubercle bacilli in the sputum, it is certain that the earlier the stage when the disease comes under sanatorium treatment the greater is the chance of survival. In Group 1 (early cases) 79·3 of the male patients and 89·7 of the female survive five years, the corresponding number of survivors after ten years being 65·5 per cent. and 85·2 per cent. respectively.

Sex.	Number of patients.				Years of life observed.	
	Discharged	Died.	Lost sight of	Living in 1918.	Number.	Average number.
Males ..	2393	1207	209	977	11,446	4·8
Females .	1007	378	134	495	5,152	5·1

Those already convinced of the value of sanatorium treatment, to whom the problem centres on the relative stress to be laid on rest and graduated labour, will be interested in the similarity of the results obtained at Frimley to those recorded by other institutions. For the rest, the direct economic return from the sanatorium treatment of cases without tubercle bacilli in their sputum would seem to be established, inasmuch as the chance of survival in these cases does not differ widely from that of the non-tuberculous; again, the progress of very early "open" cases must be deemed satisfactory. More than half the total number of cases admitted to Frimley, however, belong to Group 2 (moderately advanced cases); among these the percentage of survivors after five years is 56·8 among males and 67·4 among female patients, and at the end of ten years, 38·2 males and 49·7 females. As to the patients admitted in a really advanced stage, it is not claimed that the results are at all satisfactory from the strictly economic standpoint. But this survey, which has been carried out with evident skill and impartiality, deliberately takes no account of the educative value of the sanatorium as one of the means whereby the spread of infection is minimised and a more correct mode of life is taught. It is impossible to estimate the far-reaching influence for good that may be exerted by sanatorium training on patients willing to learn how to protect their house-mates and neighbours, and it is probable that even if the duration of life of an advanced case discharged from a sanatorium is quite short, the habits inculcated there are likely to minimise the dangers of dissemination of tuberculosis among the general public.

A HOSPITAL SHIP IN THE PACIFIC.

Surgeon-Commander W. N. Horsfall has told, in the *Journal of the Royal Naval Medical Service*, how he fitted out and managed a hospital ship in the war: it is a story that is worth reading, while it cannot be said, whatever our hopes, that no one is ever likely to be in such a position again. The ship was *Glenlala*, No. 8, equipped at Sydney in August, 1914, for service with the Pacific Fleet. Her stores and equipment were ready for her, so she was able to sail in ten days. The sick-berth staff were ambulance brigade volun-

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[1] Medical Research Council. Special Report Series No. 85. H.M. Stationery Office. 1924. 1s. 6d.

In many people, for example, the only left-handed activity appears in dealing cards, and from such an isolated action mancinism ranges in various forms through ambidexterity up to a complete inability to use the right hand for its ordinarily specialised functions. A definition, or even a standard, of mancinism is difficult to establish. The fact is sometimes overlooked that an action habitually performed by the left hand is difficult for the right, and the violinist who reversed the usual position of his instrument would find fingering with his right hand to be as difficult as bowing with his left. An interesting speculation is whether, if this reversed position had been conventionally correct, the left-hander would insist upon playing in what is now the orthodox one. This speculation arises from Dr. Inman's assumption that mancinism is a reaction of the whole personality, that it is psychologically determined and not due to an accidental disturbance in the localisation of nerve function. That it is the mark of a determined disposition finds scriptural confirmation, for the children of Benjamin valued highly the left-handed members of their fighting team, and the story of Ehud—"a man left-handed"—illustrates a fortunately rare degree of self-sufficiency and determination. The re-education of a left-hander in the ways of the herd involves the imposition upon him of the will of others, and we may find an explanation of the replacement of mancinism by a stammer in the view that the one is a protest that succeeds, whilst the other is an expostulation at its failure; the association of both in the same family may indicate temperamental modes of reacting to the same parental stimulus. We may note that psycho-analysts claim to trace stammer to the sense of guilt or fear arising from the Œdipus complex and to cure it by analysis, and many war stammers were removed by a superficial exploration of recent emotional episodes.

Unlike stammer or mancinism, squint is not easily imitated, but it *can* be imitated, and we must admit that it may be a personality reaction—that the child is doing it. Bacon noted that some can squint at will, and anticipated Dr. Inman when he wrote that "the cast of an eye is a gesture of aversion." Ophthalmologists as a whole are satisfied with the current explanation of squint, though the hypothetical "fusion centre" goes beyond what is demonstrable. It is difficult to conceive that the child can produce the symptom, even as an unconscious reaction; but the suggestion of a predominant emotional factor opens up such possibilities, not merely of clinical benefits but also of wider understanding of general principles, that Dr. Inman's evidence should be closely examined. His attempt to establish the relationship of the three conditions should be capable of statistical examination, but it is obvious that controls on a large scale are necessary. We must count the misses as well as the hits, a precaution too often not observed by that increasingly numerous body of writers who found their judgments on the comparison of figures. The psychologist may see something of value in intuitional judgments concerning these conditions. The parent or teacher tends to regard them as volitional and demands that the culprit should cease to offend, and this attitude, however bad its results, may depend upon a dim perception of the truth according to Dr. Inman. In regard to stammer his views will meet with little opposition, for they are already freely accepted; left-handedness is scarcely pathological, and whether its basis is anatomical or emotional is only of theoretical interest: but his attack upon the firmly entrenched position of his fellow ophthalmologists should stimulate further investigation of the temperamental reactions of the squinting child.

OBLIQUE ADVERTISING.

It was a piquant coincidence that the World's Advertising Convention visited Bradford on the actual day on which the Representative Body of the British Medical Association was discussing the question of procedures that might fall under the head of advertising by members of the medical profession. Advertising of a person differs essentially from advertising of a product, if only because a product is susceptible of analysis to prove the rightness of claims made for it, whereas a person cannot be cross-examined upon his fitness for any status that appears to be assumed publicly either by him or for him. We have been well reminded in the daily press that advertising is an art that applies only to products in bulk, and the Convention endeavoured, and with some success, to redeem the word from the discredit into which it has been brought as a synonym for trickery and dishonesty. The discussion by the Representative Body will be found on page 244 of this issue.

If we assume, in relation to what appears in the lay press, that in both trade advertisements and professional publicity the goods are honest, the essential difference remains between the repeated asseveration in the former case, that counts by its mere cumulative effect, and the public statement made upon a particular and topical subject by a medical man, which counts by reason of his established reputation. There are frequent situations in which the signed statement of a man of science, such as a medical man, is of the highest public value, and a very striking instance was afforded in the daily press last week apropos of a much-advertised remedy, in which the phrases "eminent chemist" or "eminent doctor" would obviously have counted for little or nothing—the actual names were needed, and it is the publication of names which offends the ideals of medical ethics. In this respect the otherwise admirable and practical report of the Association's Central Ethical Committee, which we print at length on page 246, was felt by the Representative Body to be out of touch with the actual situation. The newspapers, the report runs, can give the necessary assurance to their readers as to the professional standing of the authority quoted without mentioning names; but the meeting was quite definite in regarding as unreal the suggestion that names do not count. What professional opinion demands is rather that names shall only be used when they do count, and that there shall be some tribunal other than the authority himself or the organ of the press which claims him as an authority, to decide whether the name does count or not. Dr. R. L. Langdon-Down pointed out on behalf of the Ethical Committee that the basis of professional reputation must not be the self-praise of the individual nor the appreciation of those unqualified to judge, nor should it depend on the frequency of the appearance of the practitioner's name (with or without photograph) in the public press. The report of the Ethical Committee, he said, was an endeavour to clear their own minds and to treat the subject of advertising as a live part of "professional law," by which the speaker meant some accepted code of medical ethics. The principle is easy, only the application is difficult; and he held it to be the function of the British Medical Association to insist on the guiding factors, leaving to the General Medical in contrast to "racial" foreigners (or, indeed, to know whether by "national" he means "racial") and his reply to the proposition that there is no "instinctive" aversion to foreigners, a view set out well in Mr. J. H. Oldham's recent book, "Christianity and the Race Problem." But the book is, of course, small, and the author raises questions which would want an encyclopædia for adequate ventilation, so that what will appear to many to be cursory treatment is mostly a necessity of space and time, and sometimes, perhaps, a consequence of the author not having thought very hard on matters outside his immediate professional province. Generally, the book may irritate the progressive revolutionary, because it finds in biology grounds for defending the existing conservative order. And it will disappoint the visionary, because of its uncertain views about the future. If man imitates the numerous past evolutionary lines which have grown progressively longer and more complicated, he is evidently destined to come to an end altogether pretty soon. The share which chance takes in his ontogeny inclines Prof. Dendy, in another place, to the view that man is the sport of a Nature which is indifferent to his welfare. But he thinks that the world is big enough to accommodate the human race and he would have men choose their own wives—which are more cheerful thoughts.

There is a mistake (p. 62) about incompatibility of bloods for transfusion in man. The blood of a near relative is not much more likely to be suitable than that of a complete stranger: it depends on their precise genetic constitution in respect of isoagglutinins.

THROMBOPENIC ANÆMIA AND SPLENECTOMY.

THE fourth of the formed elements of the blood, the "platelet" or "thrombocyte," has laboured under a cloud in this country. Long ago it was pronounced to be an artefact or at best a fragment of the nuclear material of a dead and gone leucocyte, and as such it has been dismissed as unworthy of the serious contemplation either of the practising medical man or of the laboratory worker. In the years during which it has been regarded as a subject hardly suitable for conversation among polite British hæmatologists, however, it has been enjoying a large degree of attention abroad, particularly among the German and American workers, and the time now appears to have arrived when even in this country it must be admitted to a place in the blood picture. That the blood platelets undergo important alterations both in number and in appearance in at least one particular type of the hæmorrhagic diathesis was pointed out ten years ago by Duke[1] in America, and a little later by Frank[2] in Germany. Frank from Berlin, and Kaznelson[3] from Prague, both described a syndrome characterised by purpura hæmorrhagica in association with splenomegaly. In this condition they found the blood invariably to show a severe anæmia of aplastic type, together with a great reduction in the number of the platelets; usually there was also a leucopenia, sometimes extreme in degree, with its main incidence upon the granular leucocytes. Both Frank and Kaznelson regarded the reduction of the platelets as the immediate cause of the purpuric manifestations; for this condition Frank used the term "thrombopenia," which has come into more or less general use, though the term "thrombocytopenia," suggested by Kaznelson, is preferable, if not on the grounds of euphony, at least as an accurate statement of the state of affairs which it is intended to indicate. Three cases of this thrombopenic anæmia, all showing purpura and splenomegaly, were recently reported by S. C. Dyke[4] in THE LANCET; in Dyke's cases infection of the hæmatopoietic system was found post mortem in every case, but this was regarded by the author as secondary to the weakened state of this tissue. Both Frank and Kaznelson, though on different grounds, implicated the spleen through a disorder in its function as the cause of the condition. Frank regarded the thrombopenia as due to an aplastic state of the bone-marrow, the source of the platelets, and this myelophthisic condition he thought to be brought about by some toxic body produced in the spleen and acting through the blood-stream. Kaznelson found the enlarged spleen from one of his cases to be crammed with platelets, and on the strength of this observation concluded that the diminution of these bodies was due to their abnormal destruction by the spleen. Both Kaznelson and Frank recommended splenectomy for this condition, and practised it with apparently beneficial results.

In the last published volume of the International Clinics, N. E. Brill,[5] of New York, records one further case of splenectomy for purpura hæmorrhagica, and demonstrates a second case in which operation had not been undertaken at the time of reporting; in this second case the spleen was also removed later, and the results of both operations have since been described together by the same author.[6] In both cases splenectomy resulted in the immediate cessation of the hæmorrhages, which had been severe and long-continued, and in the apparent restoration of the patients to complete health. So sudden was the cessation of the hæmorrhages in his cases that Brill was inclined to doubt whether the purpuric manifestations could be entirely accounted for by the existing thrombopenia. He found that, although the platelet count rose immediately after the splenectomy, it fell within a week almost to its previous low level, and concluded that some factor other than mere reduction in the number of the platelets must be present to produce purpura; this factor, he suggested, might be some unknown substance produced by the spleen and acting through the blood-stream. His views are thus seen to partake of those of both Frank and Kaznelson. Probably the end of the matter is not yet, but very strong evidence in support of the view of Kaznelson was produced by S. P. Bedson at the meeting of the Pathological Association of Great Britain and Ireland, held in London a few days ago. Carrying on the previous observations of J. C. G. Ledingham[7] this worker was able some time ago, by the use of an antiplatelet serum prepared from rabbits by the injection of guinea-pig platelets, to show that destruction of the platelets in the guinea-pig was always followed by purpura.[8] At the meeting in question he showed four guinea-pigs, two of which had undergone splenectomy, and all of which had received the same dose of antiplatelet serum. The unsplenectomised animals showed an intense purpura; those from which the spleen had been removed, on the other hand, showed no hæmorrhagic manifestations. Bedson offered as an explanation of this phenomenon the fact observed by himself that after splenectomy the platelets greatly increase in numbers, as a result, he suggests, of the removal of the normal thrombocytolytic action of the spleen. He found that this increase of platelets in the guinea-pig after splenectomy was only temporary, and that as other portions of the reticulo-endothelial system took on the function of dealing with the thrombocytes, their numbers again fell to normal. On this supposition the benefit to be expected from splenectomy in purpura hæmorrhagica should be only temporary; whether this will prove to be the case remains to be seen. Already the operation has been performed at least twice in this country for this condition and reports may be expected in due course.

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[1] Duke: Arch. Int. Med., 1913, xi., 100.

[2] Frank: Berl. klin. Woch., 1916, xxxvii., 2, xli., and subsequent vols.

[3] Kaznelson: Zeitsch. f. klin. Med., 1919, lxxxvii., 133.

[4] Dyke: THE LANCET, 1924, i., 1048.

[5] Brill: International Clinics, March, 1924, i., 34th series, p. 34.

[6] Brill and Rosenthal: Arch. Int. Med., 1923, xxxii., 939.

[7] Ledingham: THE LANCET, 1914, i., 1673.

[8] Bedson: Jour. Path. and Bact., 1922, xxv., 94.

teers, who, though with little previous experience, did capital work, especially when they had unlearnt their first impression that they were working as a favour, and did not have to do as they were told. Commander Horsfall, who had been a staff surgeon in the Navy, seems to have concentrated on essentials, and generally managed to see that they were got. The six medical officers under him were sent on board in plain clothes and the volunteers did not acknowledge their authority, which made things awkward, but Commander Horsfall, with the help of the nursing sisters, made them shoulder straps, "when the surgeons became commissioned officers," and all went well. He adds: "The Navy is a great service and its discipline is such as to give to one the greatest freedom." It will be easier to fit out a hospital ship in future, whether the action has to be taken in routine or under emergency, and those who want to know what to do and how to do it should consult Surgeon Rear-Admiral Sutton's book on the subject. But personality will always find outlets. No book instruction will help a man much during a strike of the firemen in their forecastle, nor can a written recipe be given for Commander Horsfall's arguments when he persuaded them to call the strike off and let the ship go to sea.

We notice a curious misprint in this issue of the journal. The well-known Parkes Memorial Prize does not commemorate the distinguished R.A.M.C. officer Surgeon Parke, who crossed Africa with Stanley and won high appreciation for his care of the sick; but was founded in honour of the famous E. A. Parkes, the father of modern military hygiene and first professor of hygiene in the Army Medical School.

THE SUBNORMAL EX-SOLDIER.

ALTHOUGH it is now over five years since the armistice was signed, the time has not yet been reached when the care of the man who came back broken from the war can be relaxed. Lord Haig points this out in an introduction to the fifth annual report of the Enham Village Centre, adding that at this centre the outlook of many disabled ex-Service men has again become happy and contented after years of hopelessness and uncertainty. It has always been one object of this Centre, the policy of which was conceived and has largely been directed by medical men, to establish a permanent settlement for those men who, owing to the nature of their disability, are considered unfit for re-entering the labour market. Fifty disabled men are now permanently employed or settled at Enham, 30 of them occupying cottages, and a wood-working factory has been erected, fitted with up-to-date machinery, and capable of employing 100–125 men. The population of the Centre has, indeed, risen from the original number of 62 to the present large total of 468, all told. At the same time, during the last 15 months, a scheme has been developed under the Ministry of Labour to include industrial training for those able to do 44 hours' training per week. The actual number of these, naturally, is now diminishing from year to year, as there become fewer cases eligible for combined treatment and training, but it is the ambition of the promoters that as the supply of war victims falls, the Centre may remain as a national establishment for the restoration of health and for the physical re-education of other persons injured in the service of the State. Dr. G. V. Stockdale, medical officer to the Centre, tells us that of the 103 cases remaining in residence on the first day of the present year, 46 were suffering from neurasthenia, 35 from general surgical conditions, half of them being gunshot wounds of the head, 19 from general medical conditions, three from the results of tropical diseases, the proportion being practically the same as last year. Pensioners who, by reason of their disability, can never become employable or work for themselves, should, Dr. Stockdale feels sure, be allowed to live at home on an adequate pension; but for those who would find difficulty in getting employment outside, the system adopted at Enham appears to offer the most satisfactory solution of the disabled ex-Service man's problem. Employment is here offered under sheltered conditions; the man is freed from anxiety and encouraged by a feeling of comparative independence. Of the 622 men who had left the Centre up to the time of the report, 348 were reported as employed and in training, 52 as unemployable (80–100 per cent. pensions), and 33 as unemployed. Every effort is being made to find work for these men, for all of whom references can be given. The chief wants of the Centre are now more cottages, an outlet for articles produced in the new workshops, and an endowment fund of £100,000 to supplement the work of men suffering from severe disablement who can never become economic productive units. The economic position of the Centre is not yet what it should be, and there are difficulties to be met, but the report is a record of a successful and well-administered piece of practical philanthropy.

BIOLOGY AND SOCIOLOGY.

Prof. Arthur Dendy[1] believes that the general principles of biology can help us to solve the various social and political problems which bother us to-day. With his primary postulates not everyone will agree, and it is well that he has set them out plainly. The pyramid of society is based, he says, on what took place in the world of living things before mankind came into existence. It may be so. But there is a not unimportant school that thinks it more likely that man's soul is qualitatively a new thing, added to the accumulation of evolved attributes and not necessarily arising from them. On the other hand, it has also been urged that the dead and live worlds form one continuous whole with qualities differing quantitatively rather than qualitatively in its diverse parts. Prof. Dendy premises, too, that the laws which governed organic evolution in its earlier stages were not repealed when man arrived on the scene. They may not have been repealed, it is true, but some people think that they have been added to to such an extent that, like a good many old laws, they no longer run. With these possible divergencies of outlook at the very beginning, anyone who believes that progress for the future may be obtained by a study of the past will read the book with interest. It is intended more especially for those without any special knowledge of biology: there is much more biology than political economy and the biological exposition is of the high order that we should expect from the author of the "Outlines of Evolutionary Biology." The sociological conclusions are put shortly and dogmatically, the position of women, the House of Lords, birth-control, democracy, the colour question, and so on, are disposed of summarily enough. Broadly speaking, four main biological topics are dealt with. The fact of organic evolution shows that man is an animal in series with other animals. The study of the community of organs which makes up the individual and of the integration of individuals to make insect and similar societies points the way to the arrangements which are desirable in human communities. The inherent variability of live things indicates that the idea of the essential equality of all men is delusory or worse. The facts of heredity and modern knowledge of its mechanism are of prime constructive importance: "it is better to be born with the right kind of chromosomes than with a silver spoon in one's mouth." Such, with many subsections, is the main argument. We could wish that parts of it had been set out in greater detail. Prof. Dendy mentions, for example (p. 63), "the instinctive aversion to foreigners which lies at the root of national feeling." It would have been interesting to hear his discussion of "national" dealt with is ruptures of the sclera. Those caused by slowly moving objects. such as stones or fists striking the eye-ball directly. occur in the equator where the eye is least supported. On the other hand, rapidly moving missiles which pass through the orbit, but do not strike the eye directly, may yet cause a rupture of the side opposite to the point of impact of the air-wave caused by the missile—i.e., at the point of contre-coup. Concussion changes of the iris and ciliary body include irido-dialysis—i.e., the tearing away of a portion of the iris from its peripheral attachment, and dislocation of the iris peripherally causing a pear-shaped pupil, or in severe cases an "apparent iridectomy." Concussion changes in the retina and choroid occur in three situations: (1) the area adjacent to the site of impact; (2) the macular region: and (3) opposite the site of impact. The first situation is the most constant, so that in cases where the entrance wound is insignificant the ophthalmoscope may give the first proof that a foreign body has traversed the orbit. Histologically hæmorrhages in and about the retina and choroid are of every variety, subhyaloid, inter-retinal, and subchoroidal. The four main changes found in the retina are (1) the shrinking and disappearance of the nuclei of the granular layers, (2) vacuolation of its substance, (3) the splitting of the retina into layers by hæmorrhages, and (4) folding of the retina. Evulsion of the optic nerve may also be a concussion phenomenon—i.e., without any penetrating wound. A blow on the front of the eye may so increase the intra-ocular pressure as to break through the lamina cribrosa and expel the nerve. The lamina cribrosa may also be ruptured by the explosive effect of a missile passing through the back of the orbit or by extreme rotation of the eye. In either case the optic nerve will be extremely stretched and evulsion of the nerve head may occur. This article and the plates that accompany it should be studied in the original.

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[1] Biology and Sociology: The Biological Foundations of Society. By Arthur Dendy, Professor of Zoology in King's College in the University of London. London: Constable and Co. 1924. With 21 figures. Pp. 197. 7s. 6d.

WET BERI-BERI IN FRENCH COLONIAL TROOPS.

Major J. M. Fricker describes, in a recent number of the *Archives de Médecine Militaires*, a small outbreak of wet beri-beri which arose in France among some Hovas from Madagascar. In June, 1923, several of these men were placed upon the sick list, their most conspicuous symptom in all cases being an œdema which was very marked in the face and lower limbs. Several of the patients died, and with a view to special laboratory investigation all of the remaining cases were gathered into a hospital at Châlons, where they came under the care of Major Fricker. Fifteen in all of these special cases were received. The most striking evidence of disease was the facial œdema, with puffiness of both eyelids, and, in the three worst cases, a full moon-like appearance, noticeable because the Hovas have very well-cut features. Those lightly attacked had œdema of the legs: in the three severe cases the œdema had gradually appeared higher and higher, invading thighs, hips, scrotum, penis, abdomen, and trunk, so the vertebral spines could not be felt. Each gave a history of 20 or 30 days of slowly increasing swelling of the legs. They were all easily fatigued and complained of breathlessness and pains in the legs. Examination showed but one positive further sign, oliguria; no pyrexia, no albuminuria, no casts, no heart lesions, no pareses or anæsthesiæ, but the three advanced cases manifested ascites, pulmonary œdema (with cough), pleural effusion (no fibrin in the fluid drawn off), and pericardial effusion: they had also orthopnœa. None had ankylostomiasis, so the diagnosis made was the wet form of beri-beri. All had been a year in France, and had been getting a diet of rice and meat, but with too few green vegetables. They were put on lightly boiled eggs, plenty of green vegetables, salads, lemons, and beer yeast, and the slight cases had recovered in ten days. The more serious got, in addition, theobromine as a diuretic, cardiac tonics, a salt-free diet, and little to drink; they soon began to pass more urine, their œdema passed off, and they were well in three weeks.

THE VIRUS OF FOOT-AND-MOUTH DISEASE.

THE *Berliner Tieraerztliche Wochenschrift* of July 4th contains a set of reproductions of ultra-microphotographs of foot-and-mouth disease cultures, some of which we reproduce here. Fig. 1 shows a superficial deposit of a culture on a solid medium, with many colonies under a magnification of 375; they take the form of small elevations the size of a red blood cell. Fig. 2 shows the same colonies photographed with spectral blue light under a magnification of 1200. Fig. 3 shows the same colonies photographed with Köhler's ultra-micro-photo apparatus, with ultra-violet cadmium light (×2000). Fig. 4 shows a smear preparation photographed with ultra-violet light. These interesting photographs give a good idea of the appearances of the colonies, which be it remembered, are themselves scarcely larger than a single yeast cell.

FIG. 1.

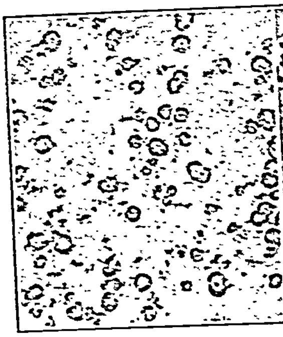


FIG. 2.

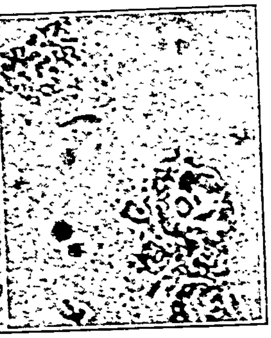


FIG. 3.

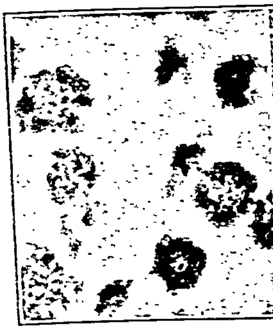
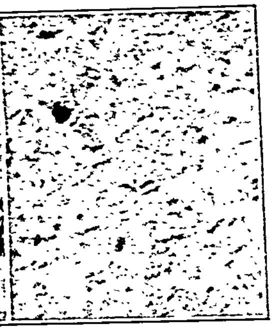


FIG. 4.



Sir Harold J. Stiles, K.B.E., has been appointed by the King an honorary surgeon to His Majesty in Scotland, in the place of the late Sir William Macewen.

Dr. E. H. Kettle, who has held since 1919 the post of pathologist to St. Mary's Hospital, London, and lecturer in pathology at the medical school, has been appointed to the chair of Pathology and Bacteriology in the Welsh National School of Medicine, vacant by the death of Prof. Emrys-Roberts.

THE Royal Commission on National Health Insurance announce that they will commence to hold meetings for the hearing of evidence in October next. Any persons or bodies desiring to give evidence should in the first instance communicate in writing with the Secretary of the Commission, Mr. E. Hackforth, at the Ministry of Health, Whitehall, S.W. 1, stating the main heads of the evidence they desire to submit.

THE HEALTH OF THE MERCHANT SEAMAN.

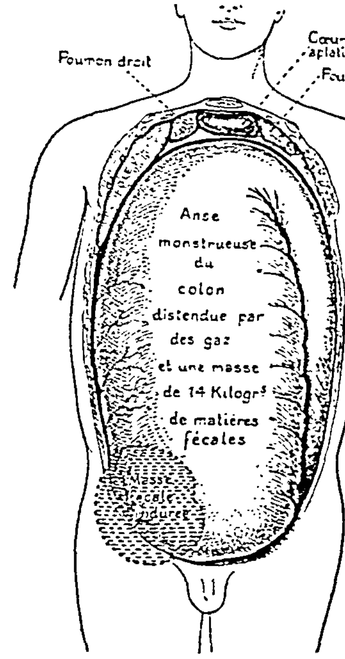
IN the course of a discussion on ship sanitation at the Royal Sanitary Institute congress at Liverpool, which was reported in our last week's issue, a plea for the collection of statistics of death in the Merchant Marine was put forward by Fleet-Surgeon W. E. Home. Commenting on papers on the Present Standard of Ship Sanitation and on the Hygiene of the Tramp Steamer, communicated respectively by Dr. W. Hanna and Dr. J. Howard Jones, he pointed out that these two excellent papers on hygiene made no allusion to statistics of illness or deaths in the Merchant Marine, and that, in fact, no useful health statistics were published as to this service. The Army, Navy, and Air Force had organised medical services to watch and report on their health. For the rest of the people of England, except the Merchant Marine, the Ministry of Health was responsible. Nobody was responsible for the health of the merchant seamen. All that could be ascertained about his health or his diseases was in the Return of Deaths on Vessels, issued by the Board of Trade, which was an unsatisfactory report. It contained lists of the deaths that occurred in 1921 among British seamen, foreign seamen, and Lascars, but the total figure (274,216) was not differentiated among these groups. If the proportions were the same as in 1914, the several numbers would be (in thousands) British, 190; foreign, 33; Lascars, 50. The speaker had been unable to find that the head-quarter staff of the Board of Trade contained any doctors. Tuberculosis was classified under "Group B, Constitutional," the Board of Trade not having yet heard, apparently, that tuberculosis is known now to be infectious. A classification which linked tubercle, rheumatism, and cancer in one group was once in vogue in the Navy, but was given up by the Admiralty in the Navy Health Blue-book as long ago as 1886. Fleet-Surgeon Home quoted other anomalies of classification and submitted two resolutions begging the Council of the Institute to ask that at least better returns be provided in future, but that, if possible, the care of the health of merchant seamen should be handed over to the Ministry of Health and taken altogether away from the Board of Trade. This was seconded by Alderman Askew, chairman of the Hull and Goole Port Sanitary Authority, and carried unanimously.

EXANTHEMA SUBITUM.

THE occurrence of rashes associated with fever in infancy and early childhood has been widely recognised, and has usually been attributed to digestive disturbances. While these rashes are of no serious import to the patient they are often a source of perplexity to the practitioner, owing to their resemblance to the infectious exanthemata, more particularly to rubella. During the last decade a number of continental and American pædiatrists have described cases of fever, lasting a few days, and followed by an exanthem, but showing no evidence of infectivity. Dr. E. Glanzmann, of Berne,[1] reviews the literature of this subject, and describes a number of cases which he has observed during the last six years. He is of the opinion that cases of remittent fever lasting three days, falling by crisis, and followed a few hours later by an exanthem, are sufficiently numerous and true to type to justify their description as a clinical entity, for which he has retained the name of *Exanthema subitum*, which was suggested by B. S. Veeder and J. Hempelmann in 1921. The rash, usually morbilliform but occasionally erythematous, is most copious on the trunk, and scanty or absent on the face and limbs, it disappears in from 24 to 48 hours. The blood-picture is sufficiently constant to be of diagnostic value, showing marked leucopenia with a relative lymphocytosis. Dr. Glanzmann discusses in detail the points by which this syndrome may be distinguished from the other exanthemata. The authors whose articles are noticed in this paper are not in complete agreement about the nature of this condition. Dr. Levy regarded it as an atypical form of rubella; in some of his cases the cervical glands were enlarged. One point of interest which is not mentioned might emerge from the after-history; how many of these cases subsequently contract rubella?

CONGENITAL ENLARGEMENT OF THE COLON.

AT a recent meeting of the Medical Society of the Hospitals of Paris, Drs. Bergé, Chevrier, and Lefèvre demonstrated post mortem a case of congenital enlargement of the colon in a boy of 15. The patient had suffered from constipation since birth, and had often felt no call to stool for periods of a week or even a month at a time. He was operated upon for an attack of intestinal obstruction, and died a few days later. At the autopsy it was found that not only the abdomen but the thorax also were completely filled by two loops of the colon, one of which was distended to an enormous extent. At first sight it seemed as though the thoraco-abdominal cavity, from clavicles to pubis, contained nothing but these two enormous loops of colon, but closer examination revealed a narrow space, about 2 inches in depth, in the upper part of the thorax, into which the heart, the lungs, and the liver were compressed. The spleen alone retained approximately its normal position. (See figure.) The loop of distended colon measured 50 cm. in length, 27 cm. in breadth, and 51 cm. in circumference. The retained fæcal matter weighed almost 14 kg., and the loop contained much gas. "This weight and these dimensions," says a French correspondent, "justify the publication of this case and diagram."


Poumon droit
Cœur refoulé et aplati en galette
Poumon gauche
Anse monstrueuse du colon distendue par des gaz et une masse de 14 Kilogrs de matières fécales
Masse fécale indurée

Congenital enlargement of the colon.

CONCUSSION CHANGES IN THE EYE.

IN the current number of the *British Journal of Ophthalmology* Sir William Lister discusses some concussion changes met with in military practice. The main part of the paper now published was read at a meeting of the American Academy of Ophthalmology and Oto-laryngology at Washington in 1923; it is liberally illustrated by coloured plates of fundi and many figures and diagrams. The first subject

amœbic infection exist side by side, and in such an event a course of treatment with emetine is of primary importance. Wasting is often a marked feature of chronic dysentery, and may be so extreme that the nourishment of the patient becomes the paramount consideration. Under these circumstances better results may be hoped for if the patient is placed on a fairly generous dietary, composed of soft semi-solid articles of food, from which everything of an irritating nature is rigidly excluded, than on a strictly fluid régime. In the management of the bowels constipation may call for the use of sulphates, or in some cases repeated small doses of calomel (gr. ¼ four times in the day) may be remarkably beneficial. In other cases profuse and exhausting diarrhœa is a prominent feature, and may be met by β-naphthol (gr. 5 in cachet four times a day), or bismuth salicylate (gr. 20 four times a day). Lavage of the intestine is more often useful than in acute dysentery; a long soft tube should be employed, and the fluid allowed to flow in gently through a funnel by gravitation. Dilute solutions of antiseptics, such as eusol, or of astringents, such as silver nitrate or copper sulphate (1 in 1000), may be used, but it may be regarded as doubtful whether these have any real advantage over cleansing injections of warm boric or weak permanganate solutions, or even of warm saline. A considerable number of cases ultimately prove refractory to all forms of medical treatment, and in these the question of securing a more efficient degree of lavage by appendicostomy should be considered, or complete rest for the lower bowel may be temporarily provided by arranging for the evacuation of the fæces through an opening in the cæcum. Vaccine treatment has been employed with a certain measure of success. Perforation is a more likely complication of chronic than of acute dysentery; owing to adhesions the resulting peritonitis is often localised, and ultimately a large circumscribed abscess may be formed. On account of the chronic nature of the process the clinical picture is often quite indefinite, and the condition may exist for some time before it is recognised; the treatment is surgical.

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[1] Schweizerische Medizinische Wochenschrift, Nr. 26, p. 589.

ARTHUR G. PHEAR, M.D. Camb., F.R.C.P. Lond.,
Physician, Royal Free Hospital, London.

Special Articles.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

THE Prince of Wales presided at a special meeting of the President and General Council of King Edward's Hospital Fund for London at St. James's Palace on July 25th.

Lord Stuart of Wortley, chairman of the Management Committee, presented a report on the recommendations of the Ambulance Cases Disposal Committee dealing with the need for additional voluntary hospital accommodation, the inquiry now being conducted by the Voluntary Hospitals Commission; and the bequests of the late Mr. and Mrs. Wells.

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The Voluntary Hospitals Commission have been asked by the Minister of Health to make an inquiry into the extent of the additional voluntary hospital accommodation required in England and Wales and the best means of providing and maintaining it. The Commission have requested the King's Fund, as Voluntary Hospitals Committee for London, to issue a questionnaire to the hospitals of London, and to transmit the replies to the Commission with a general covering report. The report will be prepared by the Management Committee with the assistance of the Distribution and Hospital Economy Committees. It was already known to the King's Fund that num schemes of extension or improvement, unavoidably postponed during the war and the subsequent financial crisis, had been and were being taken up by the hospitals themselves. Several have been completed, others are in hand, and others again have been passed by the King's Fund with a view to early action. The number of beds available at the hospitals on the books of the King's Fund has increased from 11,800 in 1913 to 13,400 in 1924, and the schemes now in hand or proposed would add another 1000 beds. During the last three years the hospitals of London, besides increasing their income from £2,430,000 to £2,850,000, adding £991,000 to their endowments, and obtaining more than £400,000 through the combined appeal, have received about £1,100,000 for extensions and improvements. A large sum is, however, still required to meet the capital expenditure on these schemes. The grants from the King's Fund in aid of such schemes were reduced to a minimum in 1921, and, although they have been again increased in subsequent years, they do not yet amount to the same proportion of the capital cost of the schemes, or of the total distribution by the Fund, as they did before the war. Additional income will also be required for the maintenance of the increased number of beds.

Bequests of the late Mr. and Mrs. Wells.

The Management Committee have had before them for some time the question whether the King's Fund could take definite action to help the hospitals to meet these needs. It so happened that in February last, just when the Ambulance Cases Disposal Committee was considering the connexion between the lack of sufficient accident beds and the general question of the shortage of hospital beds, particularly in South London, the King's Fund was notified that a large sum, estimated at more than £200,000, would shortly be received under the wills of the late Mr. and Mrs. Wells. The custom of the General Council, in dealing with legacies which it has power to spend, has usually been to invest part and distribute part. It would thus be consistent with previous policy if the King's Fund, having recently invested more than £1,100,000 from the bequests of Lord Mount-Stephen and Sir Thomas Sutherland, were to include the Wells legacies of £200,000 in the estimates of the amount available for distribution if required. This is specially the case when, as at present, the hospitals are faced with various exceptional needs, such as those mentioned above. The Management Committee accordingly consulted the Distribution Committee as to the best method in which, should the General Council approve, the Wells legacies could be used for this purpose, and have received from them the following statement:—

(i.) The Distribution Committee cordially support the suggestion that the Wells legacies should be used to assist the hospitals to meet special needs.

(ii.) The Distribution Committee are of opinion that the following method of applying the legacies, in whole or in part, could usefully be considered: (*a*) Assistance in the provision of additional hospital accommodation, including accommodation for accident cases, by grants towards capital expenditure on schemes of extension, or towards the reduction of deficits on schemes that have been completed, or towards the opening of beds in extensions that have already been provided but are not yet available for the patients for whom they were intended; (*b*) assistance towards schemes of improvement as distinct from schemes of extension; (*c*) increased grants to maintenance, including the maintenance of additional beds.

(iii.) In connexion with the provision of additional accommodation, including accommodation for accident cases, the Distribution Committee consider that there is urgent need for a further step towards the completion of the full service of King's College Hospital, where 162 of the 388 beds provided in 1913 by the removal to Denmark Hill are still not available to meet the shortage of beds in South London.

(iv.) The Distribution Committee think that, when they are preparing proposals for the application of these exceptional legacies, they will sometimes find it desirable that definite conditions should be attached to the grants—e.g., a condition that beds should be opened, or that beds should be reserved for accident cases, or that a scheme should be put in hand at once, or that the balance required, or a specified part thereof, should be raised. In some instances it would be an advantage that the Committee should be in a position to make a definite arrangement in advance with the hospital concerned. In suitable cases the exceptional grants might be used in this way to stimulate fresh activity on the part of hospitals.

(v.) Under the scheme outlined above, the whole amount would not be distributed at once. For example, grants for the opening of beds would be spread over a period of years; grants in aid of extensions and improvements need not be wholly confined to schemes already submitted; and part of the sum received from the legacies might be retained for the present in case new needs should arise.

In conclusion, the Management Committee approve generally of the proposals contained in the report.

Lord Stuart, in moving the adoption of the recommendations, said that the replies to the interrogations issued at the request of the Hospitals Commission gave evidence of the care which the hospitals were giving to the answers. Lord Revelstoke, honorary treasurer and chairman of the Finance Committee, seconded the proposal and was supported by Sir Cooper Perry, chairman of the Distribution Committee, and Sir William Collins, chairman of the Ambulance Disposal Committee. The motion was carried unanimously.

The Prince of Wales, after reading a letter from the King in which His Majesty endorsed the action of the Management Committee and expressed his gratification that the Fund should be in a position to afford at the present time special assistance to the voluntary hospitals, continued:—

"I wonder if there is anyone who still thinks the voluntary hospital system is dead, or dying. If so, let him look at the facts and figures before us to-day. Even in 1920, when the crisis was at its worst, the hospitals of London had an income of £2,400,000 as against £1,500,000 before the war. Since 1920 their income has increased to £2,850,000, without counting any of the £400,000 raised by the Combined Appeal; £990,000 has been added to their endowments; and £1,100,000 has been received for extensions and improvements. This means that, over and above their annual income, which last year was nearly twice what it was before the war, the voluntary hospitals, in London alone, have received in three years two and a half millions for special purposes. And this does not include the additions, during this same period, to the investments of the King's Fund itself. Then, again, there are 1600 more beds than there were before the war, and the extension schemes now in hand, or proposed, would add another 1000. This is not decay or death. It is life—and very vigorous life. More than that, it is growth. The hospitals are not satisfied with merely making both ends meet—difficult as that seemed a short while ago. They are constantly expanding in response to the ever-growing need for better equipment and more beds. Even during the crisis they never quite stopped doing this. Extensions and improvements, like so many other good things, were delayed by the war, but they still went on here and there. After the war new schemes came with a rush; so much so that the King's Fund had sometimes to act, much against its will, as a restraining force; taking the view that, except in specially urgent cases, the maintenance of the hospitals, as a whole, must have precedence over appeals for capital expenditure in any particular instance. The distribution of the surplus funds of the Red Cross Society and the Order of St. John, through the King's Fund, helped a large number of schemes. Nevertheless, a good many had still to be postponed.

But gradually the position has changed. With the aid of the temporary Government grants and the Combined Appeal, most of the deficits are paid off. Income of all kinds, voluntary contributions, patients' payments and workmen's collections, the ordinary distribution of the King's Fund, all are increasing. There are, unfortunately, some institutions still in grave financial difficulties. And the hospitals are all faced with the increased expense involved in new methods of medical diagnosis and treatment. But, taken as a whole, they have been able to turn their attention more and more to extension. The King's Fund last December increased its grants in aid of schemes. The public, which by its gifts helped to save the hospitals in 1922, is now, with equal generosity, supporting their new ventures. More than one large appeal for special objects, such as endowment, reconstruction or extension, has in recent months been conspicuously successful."

Continuing, the Prince said now that the Council had approved the general principle, the Distribution Committee could prepare plans for the actual use of the money. They had already collected a good deal of information about the most urgent needs of the hospitals. One of these, the need for additional accident beds, especially in South London, had been brought before the public more than once in recent months, and it was gratifying to hear from Sir Cooper Perry that the decision of the King's Fund would enable immediate action to be taken to meet that need. The Distribution Committee had also before them a long list of schemes of extension and improvement, and there were other special needs. The King's Fund was making its special contribution to the forward movement, but it could not be, and did not want to be, a substitute for that individual interest and individual effort which, under the voluntary system, was the source of life to the individual hospital. The King's Fund had its own particular function. It was concerned with the needs of London as a whole, and with the relative needs of the different districts. It had exceptional means of comparing the circumstances of the various hospitals. And where a donor or a testator was not specially interested in any one institution, but desired to benefit the hospitals of London generally, or to have his gift distributed in proportion to needs, he could, if he so wished, avail himself of the facilities of the King's Fund.

The meeting closed by a vote of thanks to the Prince of Wales, moved by Lady Ampthill and seconded by the Chief Rabbi, which His Royal Highness briefly acknowledged.

THE NUTRITION OF MINERS AND THEIR FAMILIES.

IN the autumn of 1922 considerable public attention was directed to the state of affairs in the coal-mining industry. For various reasons of economic sort the prosperity of persons employed in this industry was greatly depressed, and it was freely stated that the available income of families dependent upon the mines for subsistence was insufficient to provide the bare means of life. Questions were asked in the House of Commons, but no detailed evidence as to the precise domestic circumstances of the miners' families was available. The Committee on Quantitative Problems of Human Nutrition appointed by the Medical Research Council decided, with the financial support of the Department of Mines, to investigate the matter, and the result of this investigation has now been published.[1]

The food requirements of man are first set out and a provisional assessment is made of the needs of the coal-miner. The study of family budgets forms the next section of the report, with an account of the method of inquiry pursued by the Committee. A critical discussion follows, and then a tabular statement of the height and weights of the children of miners. Finally, certain general conclusions are reached which are set out below in the words of the Committee:

General Conclusions.

The material upon which this report is based is too scanty to authorise any sweeping conclusions, but is, in our opinion, so accurately compiled that a high degree of probability attaches to some inferences, but before noting them the following points must be borne in mind and any conclusions must be interpreted in their light.

(*a*) Many of the families investigated were burdened by debt, the aftermath of the strike, and therefore a wage, which might have been sufficient to provide an adequate supply of food, was so reduced as to make living difficult.

(*b*) In some of the families, at least, the amount of money allowed to the wife, for the purchase of food and the household expenses generally, bore no relation to the wage earned, and it is not known in these cases exactly how much was actually earned.

(*c*) It must again be emphasised that, when comparisons are made between the physical condition of the miners' children and those of the general average for the county area, the numbers of miners' children studied were very small. In some groups the numbers for comparison were as low as two. Another point in this connexion on which we have no direct evidence is whether or not there is any hereditary difference as regards physical condition between the average mining class and the average population of the areas investigated.

Subject, then, to these limitations we conclude:—

1. That during the period of observation (December, 1922, to March, 1923) the average consumption of food in one district, Derbyshire, was sufficient to maintain healthy existence, and, in that district, the children of the miners whose family diets were studied differed in respect of height and weight in no significant way from the average of the whole county.

2. That the diets of the four other districts, and in particular of the Durham area, if the energy requirements in these areas be comparable with those of Derbyshire, fell somewhat below the standard generally accepted as satisfactory. In Durham the children measured were in respect of weight slightly below the county average.

3. That quite apart from differences of income there are variations of diet from district to district and within each district which suggest that housewives could be helped to secure a more adequate return for their expenditure by a better dissemination of knowledge both of the economic and hygienic aspects of diet. There is evidence that in the districts where bread is baked at home the diets are more satisfactory.

4. The absence of a definite correlation between the weights of the children and the calorie intake seems to indicate that factors other than diet, so far as examined in this report, influence the state of nutrition of these children.

5. That there is evidence which would suggest that the diets of families of which the mother had had training in domestic service are better than the average, but the evidence is not conclusive.

The personnel of the Committee upon Quantitative Problems in Human Nutrition responsible for this report is as follows: Prof. E. P. Cathcart, M.D., F.R.S. (chairman), Dr. Major Greenwood, Dr. Leonard Hill, F.R.S., Dr. A. W. J. MacFadden, Sir Thomas Middleton, Prof. D. Noel Paton, M.D., F.R.S., and Prof. T. B. Wood, F.R.S.

In tending their report, the Committee express cordial thanks to various medical officers of health who collaborated with them in this inquiry, and also high appreciation of the work of the field investigators. It is evident that there has been a close and harmonious coöperation between these workers and the staffs of public health departments, which is of happy augury for the success of other investigations which it may be found desirable to undertake in the future.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Medical Register and the Irish Free State.

THE Government of the Irish Free State has taken an important step to avoid the difficulties which had arisen in regard to the admission to the Medical Register of licentiates and graduates educated in the Free State. A Bill has been introduced, and rapidly passed through the Dail, authorising the General Council established under the Medical Acts to continue temporarily to exercise jurisdiction and authority under those Acts in respect of medical practitioners in the Free State. The Bill sets out that the General Council and the Branch Council are to have the same authority, and medical practitioners in the Free State the same rights, privileges, and immunities, and be subject to the same obligations as prior to the establishment of the Free State. The General Council and the Branch Council are to continue to be nominated, chosen, and elected in the same manner as heretofore. The Medical Acts are to continue to have effect in the Free State. The duration of the Act is one year from the date of its passing. The Bill passed rapidly through the Dail and has passed its second reading in the Senate without serious opposition. It is understood that, during the year's grace which this Bill will allow, the whole question will be thoroughly studied, and that the Government will then, after consultation with the medical profession, promote considered legislation.

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[1] Reports of the Committee upon Quantitative Problems in Human Nutrition. Report on the Nutrition of Miners and their Families. Special Report Series, No. 87, Medical Research Council. London: H.M. Stationery Office. 1924. Pp. 59. 1s. 3d.

Dedication of Queen's University War Memorial, Belfast.

The chief object of the visit of the Duke and Duchess of York to Northern Ireland was the dedication of the war memorial at the Queen's University, which took place on Monday, July 21st. The Duke and Duchess were received by a large assemblage fully representative of the University and the City of Belfast, and prior to the dedication ceremony received the honorary degree of LL.D. at the hands of the Chancellor of the University, Lord Londonderry. The war memorial stands in front of the principal entrance to the University. It consists of a fine bronze statue of a winged Victory, bearing in one arm the figure of a dying soldier and raising the other arm to uphold a crown of laurel. The pedestal of granite bears the names of 253 fallen Queensmen commemorated on attached bronze tablets. The work was designed by the late Sir Thomas Brock, and after his decease was finely executed by his assistant, Mr. Arnold Wright. The Chancellor of the University opened the dedication ceremony with a brief speech recalling the services of Queensmen in the late war, and the Duke of York then unveiled the memorial. Dr. Simms, M.P., principal chaplain to the British armies in France, pronounced the dedication, and a reveillé was sounded by four buglers, followed by a prayer. Numerous wreaths were placed at the foot of the pedestal of the memorial. After the ceremony the Duke and Duchess were entertained to luncheon in the Great Hall of the University by the Chancellor and Lady Londonderry. About 200 guests sat down, the company including the Governor of Northern Ireland, the Vice-Chancellor of the University (Dr. R. W. Livingstone, M.A.), and the Lord Mayor of Belfast. Replying to a toast, the Duke of York referred to some of the recent benefactions to the University, especially the foundation of Riddel Hall as a hostel for women students, and the new gates to the University, the gift of Mr. F. A. Heron, D.L.

Strike of Municipal Workers in Dublin and Suburbs.

A strike has taken place on very brief notice on the part of the municipal workers of Dublin and the adjoining townships. It appears that at a conference held recently between the several local authorities it was decided to recommend a reduction in wages of 6*s.* a week, beginning with a cut of 2*s.* on Sept. 1st. The recommendation of the conference had not yet come before the local authorities and no decision had therefore been made. On July 19th the workers withdrew from work. Several essential services are left derelict. Fortunately the drainage system can be carried on, though the sewage is discharged once again into the Liffey, as in the time prior to the construction of the Dublin main drainage system. Electricity has failed, however, both for lighting and for other purposes. Street cleansing is also stopped, as well as removal of house refuse. The city markets, through which all vegetables and greenstuff reach the consumers, may be stopped. The strike is certain to have its effect on the public health. The action of the workers in precipitating a strike on the eve of the Dublin horse show and the Tailteann games, for which the city has been long preparing, has roused much local indignation.

The late Dr. Arthur W. W. Baker.

The death occurred recently at his residence in Dublin of Arthur W. W. Baker, M.D., M.Dent.Sci. (Hon.), F.R.C.S. Irel., long regarded as the doyen of the dental profession in Dublin. He was 72 years of age. Having taken his medical degrees in Dublin University in 1875, he chose dentistry as his specialty. He was for many years one of the leading spirits in the management of the Dental Hospital of Ireland, and the foundation and success of the School of Dentistry attached thereto were mainly due to his activity and care. Some 20 years ago, acting under his guidance, Trinity College established a school of dentistry, and the first degree in dentistry conferred by the University was the Honorary Degree of Master in Dental Science conferred on Dr. Baker. He was closely associated with the Officers' Training Corps of Dublin University, and during the war he held the rank of captain in the Royal Army Medical Corps, serving for a time in the Dublin (83rd) General Hospital at Boulogne. He was a man of much general culture as well as of learning in professional matters. He was specially interested in music, and much of his leisure was spent in yachting.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Speech Pathology in Vienna: The First Congress.

THE first Congress of Speech Pathology was held in Vienna for three days in the early part of July under the presidency of Dr. Fröschels (Vienna), and was attended by laryngologists, speech-pathologists, and linguists from all parts of Europe, as well as by members of the Government, when discussions took place on the problems of normal and defective speech.

The rise of Vienna to be the centre of speech study began with the work of Prof. Brücke, the physiologist, who made the first accurate studies of enunciation. Under his successor, Prof. Sigmund Exner, the Academy of Sciences founded the first Phonogram Archiv. Two large speech clinics have been in existence for many years. The only society for experimental phonetics is that in Vienna, and with the recent opening of a laboratory for experimental phonetics there has been a revival of the opportunity to study the science.

The Congress was opened by Dr. H. Stern, director of Prof. Hajek's clinic for laryngology, who delivered a memorial address in honour of Gutzmann, the "father of voice and speech pathology." Dr. Fröschels then read a paper on aphasia, in which he stated that although it was not yet possible to localise with accuracy the various forms of this condition, careful training of the patient gave most excellent results, even in cases of long standing. An interesting discussion followed, in which Drs. Stojanovics (Jougoslavia), Bonvicini (Italy), Pappenheim and Richter (Germany) took part. Prof. Winkler (Vienna) then demonstrated the induction of aphasia in a young lady by means of hypnotism, and Drs. Allers and Freund emphasised the important part played by complicated mental processes in the act of "finding the word." Dr. Eliasberg (Munich) read a paper on methods of testing the intellect through the speech, and Dr. Stein (Vienna) dealt with the condition known as *dysarthria articulæ universalis*, or general stuttering.

Speech in Nervous Diseases.

On the second day Prof. E. W. Scripture (London) reported in brief the results of work done in London in this subject by means of recording and analysing speech in nervous diseases. By this method he established that the changes of speech in a disease or a lesion of any part of the nervous system showed an absolutely constant and unchangeable type for this part. The records of speech showed specific alterations in bulbar paralysis that did not occur in any other disease, and again there were specific alterations found in cerebellar troubles. The speech abnormalities in the case of a nerve lesion changed only progressively or regressively and never altered their type. In his opinion it was possible from the speech curves alone to diagnose such troubles as progressive bulbar paralysis, disseminated sclerosis, general paralysis, and epilepsy. Speech in idiopathic epilepsy had a peculiar character found in no other trouble, and this characteristic indicated that the condition was not a localised affection of the cortex, but a generalised anomaly of the constitution.

Stuttering.

On the second day Dr. Hoepfner (Saalfeld) opened a discussion on stuttering. He considered that the popular term "stuttering" had hindered research and treatment in this condition, as it did not give proper credit to the various ætiological factors, particularly those of pathological anatomy, which caused the defect. He believed that the majority of such cases must be termed "associative aphasia"—that is, a disturbance of the equilibrium of the psyche produced by the preconceived idea of being unable to speak correctly. This occurred generally at a very early age.

Prof. Scripture thought stuttering was an inferiority neurosis directed toward persons who could hear, and found support for his theory that the inferiority neurosis was due to diminished activity of the suprarenal cortex in the favourable results obtained by administering preparations of this part of the gland.

In the long discussion which followed Dr. Fröschels admitted the psychic factor, saying that many stammerers were "bullied" by the idea "I cannot speak." Dr. Hetsche and Dr. Gumpertz (Berlin) opposed the use of the term aphasia for this condition; but Dr. Stern believed that a large number of such affected persons suffered from a true "temporary associative aphasia," and he considered this condition was amenable to appropriate therapeutic measures. A number of papers dealt with the beneficial effects of special classes for children with speech defects, where they were segregated from normal-speaking pupils. Prof. Hajek gave an interesting paper on the voice, speech, and music of wild tribes, illustrated by a number of gramophone records.

On the third day of the Congress the subject dealt with was

Diseases of the Voice and their Cure.

Dr. Stern opened the discussion with a very lucid and exhaustive paper. He explained the condition of phonasthenia (functional tiredness and weakness of the voice), and his methods of treating the voice of singers. He strongly advocated "washing out the larynx" with warm physiological salt solution. The phonetic laboratory under Dr. Stern in Prof. Hajek's clinic made a special point of studying troubles of the singer. Several forms of treatment were demonstrated. Although this subject was of greatest importance for large numbers of singers and vocal students, he said, it fell outside the interests and knowledge of the professional laryngologists, and could be pursued only by the special type of physician who was both a laryngologist and a voice specialist.

Of the ground covered by other papers read at the third session a brief résumé only can be given. Mr. Brömme (Frankfort) explained his methods of developing the voice; Dr. Demetnades (Athens) gave an account of the relationship between the control of the circulation by the sympathetic nervous system, the resonance of the skull, and the formation of the voice; Dr. E. Richles showed the importance of experimental phonetic methods in historical ethnographic researches; Dr. Wilheims spoke on the value of the speech as a factor in individual psychology; and Dr. Fröschels and Dr. Frajan recorded some experimental observations made during the teaching of speaking. It was resolved to present a more detailed report on this subject at the next Congress, which will be held in two years' time. At the end of the session the "Logopedic and Phoniatric Society" was founded, Prof. Scripture being elected president, with Dr. Stern, Dr. Fröschels, Mr. Rothe, and Dr. Hoepfner as members of committee.

Demonstration of Stomach Speech after Laryngectomy.

As a final act of the Congress a demonstration of patients and apparatus at the phonetic department of the clinic for laryngology was given.

Dr. Stern showed four patients: (1) A woman in middle life spoke distinctly in short sentences with a scratchy kind of voice. On lifting a neck ornament she exposed the opening into the trachea through which she breathed. Dr. Stern explained that she had been taught to swallow air into the stomach before each sentence, and to speak by pressing this air out against resistance at the top of the œsophagus. The vibrations at the opening of the œsophagus produced the tone, and the air from the stomach supplied the speech organs for enunciation. (2) A motor-car dealer in excellent health who could be heard to swallow the air before each sentence. He spoke fluently and loudly, and stated that he talked without any effort all day long. (3) A man in middle life who talked without difficulty and who could sing in a crude manner over two octaves. (4) A lady who had only been a month in training and had got only far enough to do syllables well.

The education in stomach speech requires training for one or two years. It succeeds well with many patients but not with others. The teaching of the stomach speech requires skill and practice on the part of the physician. The technique of the operation for laryngectomy and of the after-care has been so wonderfully developed in Prof. Hajek's clinic that the mortality is very small.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Meeting of the Aerzte-Vereinsbund.

THE Aerzte-Vereinsbund (the Association of German Medical Societies), a body dealing not with scientific but with professional questions, held a general meeting recently at Bremen. This was the first general meeting after an interval of three years, during which time the financial condition of Germany and of the medical profession necessitated a lapse of the annual meetings. The meeting was attended by 429 delegates of local medical societies, and first discussed the question of courts of honour. These courts are not instituted by law throughout the whole of Germany. In Prussia and in some of the Federated States they are so established, but they are not legal in Bavaria, Wurtemberg, and Oldenburg. It has been suggested in Parliament by the Social-Democratic party that they should be completely abolished, but the Prussian medical chambers with which the courts are connected protested unanimously against this suggestion. After a long discussion the association agreed almost unanimously that the courts of honour ought not only to be maintained where they are already working, but that they should also be introduced into those of the German Federated States where they did not already exist. The association also desired that medical men who were under the disciplinary power of the Government but not under that of the medical courts of honour (such as medical officers of health, army and navy medical officers, and university teachers), should not be exempted from the jurisdiction of the courts. As hitherto, in cases of unprofessional behaviour the courts could only fine a defendant and withdraw his right of voting for the medical chamber, a purely nominal penalty to medical men of a low professional standing. The meeting proposed that the courts be authorised to exclude a medical man from practice in cases of grave misdemeanour. Concerning the workmen's insurance laws, it was proposed at the meeting that compulsory insurance against illness ought to include only persons earning less than M.2400 (£120) per annum, and that no person should be authorised to remain a voluntary member of a sick-club under the Workmen's Insurance Act if his earnings were more than M.4000 (£200) per annum. The meeting then discussed the question of life insurance of the members of the profession themselves and their insurance against accidents, and agreed that such insurance should be compulsory. The amalgamation of the association with the Leipziger Verband was declined, although both societies have worked together, and will continue to work together in matters concerning the general welfare of the profession.

A Leech in the Larynx.

Dr. Messinger, a German medical man residing in Veles, Macedonia, reports a case in the *Medizinische*

Klinik where a woman in drinking water from an earthen pot suddenly felt a foreign body in the larynx, which gave rise to severe fits of coughing with hæmorrhage and dyspnœa. Neighbourly attendance proved useless, and six days later she was brought to the doctor in a very anæmic and weak condition. Dr. Messinger ascertained that the larynx and its surroundings were greatly swollen and inflamed, and covered with hæmorrhagic spots; by laryngoscopy the head of a leech could be seen in the rima glottidis attached to one vocal cord. Under local cocaine anæsthesia Dr. Messinger tried to seize the head of the animal with forceps, but did not succeed. He then touched its head with a concentrated solution of kitchen salt, with the result that the leech loosed hold of the vocal cord and disappeared into the interior of the larynx, whence it was discharged through the rima glottidis by a very strong attack of coughing. It is remarkable that the leech managed to remain in the larynx for six days undisturbed by the violent coughing.

Visa to Passports of Foreign Patients.

The Committee of the Medical Chambers have informed the Government that complaints have been made by foreign patients, on the ground that German consulates abroad have often declined to visa passports of foreigners desiring to go to German spas or to consult German specialists. The Foreign Office has answered that they had instructed the German consulates abroad to be as liberal as possible in the interest of German spas and medical men, but that such liberality has been greatly abused, especially in certain Eastern countries. In one of the consulates in the East it was stated that of 54 visas given for a visit to German spas in three cases only did the supposed patients really go to the health resort. Many undesirable foreigners try to use such visas to secure a prolonged stay in Germany, sometimes for illegal business. If the visa is declined they approach the representatives of the profession and complain of not being admitted to Germany. Giving visas indiscriminately to every alleged patient has therefore been discontinued in certain Eastern countries where the abuse has been in evidence.

Spread of Tuberculosis in Children.

Dr. Thinius, physician to a dispensary for tuberculous children, has recently carried out an investigation into the presence of tuberculosis in school-children. He selected for the investigation the town of Stolp, a country centre in Pomerania, with 35,000 inhabitants, where the housing accommodation was somewhat unsatisfactory. As the parents had been informed by the local press and by lectures of the importance of the investigation, Dr. Thinius was allowed to examine 4400 of 6900 school-children. Pirquet's reaction was used as a test for the presence of tuberculosis. It was found that of the 4400 children 39 per cent. gave a negative and 61 per cent. a positive reaction. A noteworthy fact was that in college youths of the relatively better-off class a positive reaction was just as frequent and sometimes even more frequent than in the pupils of the elementary schools of the town. The school for feeble-minded children showed the highest percentage of positive reactions—viz., 87. The average percentage of positive reactions increased with the age, being 47 at the age of 6 years and 65 at the age of 16.

Metropolitan Ear, Nose, and Throat Hospital.—The eighty-fifth annual report of this institution shows that the total income for the year 1923 was £4581, almost identically the income for the previous year. The total ordinary expenditure amounted to £3505, as compared with £3532 during 1922. The number of patients attending the out-patient department was 3667, and the total number of in-patients was 693; practically speaking, in both categories males and females were almost equally divided. The report contains tables setting out the number of cases treated for each disease coming within the special department with which the hospital deals.

Medicine and the Law.

The Costs in the Harnett Case.

Mr. Harnett, the plaintiff in the action against Dr. C. H. Bond and another, was unsuccessful in an application to the Court of Appeal asking that an order of the court as to costs should be stayed pending an appeal to the House of Lords. When the Court of Appeal, in May, allowed the appeal of Dr. Adam and ordered a new trial of the action against Dr. Bond, the usual order was made for the costs of the original action and of the appeal to be paid or provided for by Mr. Harnett before the taking of any further proceedings. It was in order to obtain a stay of this order as to costs, pending an appeal to the House of Lords against the judgment of the Court of Appeal, that the application referred to was made before the Master of the Rolls (Sir Ernest Pollock), Lord Justice Warrington, and Lord Justice Atkin. In giving judgment, without calling upon counsel for Dr. Bond and Dr. Adam, the Master of the Rolls referred to the order of the Court of Appeal as possibly inconvenient to the plaintiff, but as not rendering appeal to the House of Lords impossible. The argument on behalf of the plaintiff had shown no ground for the court exercising its discretion in the manner asked.

Manslaughter of a Child.

At the Central Criminal Court recently, the trial took place of C. W. Travis, an American subject, who has been stated to have had some medical training. He was indicted for murder and found guilty of manslaughter, having killed his own son, 10 months of age, by closing its mouth and nostrils with his hand when irritated by the child crying at night, his defence being that he thought he could induce sleep through exhaustion, following deprivation of air. Mr. Justice Shearman postponed sentence for a day, and then said that he found the problem of how to deal with the prisoner difficult. The jury had found that he had not intended to kill the child but had done so owing to a criminal impulse and with great cruelty. He had reports before him, as well as the evidence of Dr. H. A. Grierson, medical officer of Brixton Prison, to the effect that the prisoner was a man of exceptional intelligence, but not normal mentally and liable to criminal impulses. At the same time there was no question that as far as legal responsibility was concerned he was perfectly sane. His Lordship referred to the power of the Home Office to deal with the case after full consideration of the mental state of the prisoner and passed a sentence of penal servitude for five years. This appears to have been the best way to deal with the case in the circumstances. There was no evidence to show that Travis did not know the nature and quality of his act and that it was wrong, though he may have failed to appreciate the danger of depriving his child of life by the method that he adopted to keep it quiet when "teething." Having killed it he took the body in a bag to Birmingham and left it in the cloak-room at the railway station. His case will no doubt be considered before he undergoes penal servitude as a sane convict.

Dirty Ice-cream.

At Old-street police court recently a man was fined 40*s*., the maximum penalty, and one which the magistrate, Mr. Clarke Hall, observed was altogether inadequate, for manufacturing and storing "ice-cream" in a manner that exposed it to contamination. The compounding of the "ice-cream," which, as is well known, is mainly sold to children of the poorer class, was shown to have taken place in a back room and in a yard where there were found pails filled with the mixture in close proximity to an open dustbin and to refuse lying in the yard. In comment it may be observed that it is not unusual in Acts of Parliament concerning the public health to provide a penalty which may be adequate for an offender who has transgressed for the first time and perhaps ignorantly or inadvertently, but that such penalties may not be enough to deter from perseverance in a profitable trade, constant inspection of which by the authorities is not easy. It was stated that this man had been warned not once but many times with regard to his dangerous methods. Dr. G. E. Oates, who, as medical officer of health for Bethnal Green, caused him to be prosecuted, is to be congratulated upon having succeeded, at any rate, to the fullest extent permitted to him by the law.

Cotton-Spinners' Cancer.

On July 26th Judge Mossop gave a written judgment in the important claim in Ashton-under-Lyne County Court[1] for compensation by an operative mule-spinner, Harry Whiteley, of Dukinfield, on whose behalf it was alleged that he had contracted epithelioma of the scrotum in the course of his employment with the Atlas Mill Co., Ltd., Ashton. The claim for compensation was made under Schedule 12 of the Industrial Diseases Act. The point at issue was whether the disease was contracted in the course of Whiteley's employment, and for which he should be compensated. The amount of the claim was £26 5s., being 15 weeks at 35s. per week. The judge held that the applicant was entitled to compensation for personal injury by accident or disease arising out of and in the course of his employment within the meaning of the Workmen's Compensation Act, 1906. He summed up the case as follows:—

(1) "He (the applicant) contracted the disease known as cancer of the scrotum.

(2) "This disease manifested itself for the first time whilst he was employed by the respondents who were his last employers.

(3) "His employment brought him into contact with a moving bar which caused constant friction close to the scrotum.

(4) "His employment involved his overalls near the scrotum being constantly sprinkled with mineral oil.

(5) "Mineral oil is an irritant.

(6) "The applicant. when at work, used overalls which could be easily penetrated by the oil.

(7) "The atmosphere in which he worked was humid.

(8) "Investigation has proved that cancer of the scrotum is quite common amongst mule-spinners.

(9) "Combine the facts number one to seven and the conclusion is irresistible that there is a connexion between the disease and the employment, and I so hold."

Judgment was given for £26 5s. and respondents to pay the costs, and that the order would be for a declaration of liability on the part of the employers for the disease at any time hereafter. The case was regarded as a test case, and much importance is attached to the judgment. having regard to the fact that many more claims may depend on it.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. H. A. Browning is placed on Retd. List at own request.

Surg. Lts. to be Surg. Lt.-Comdrs.: A. W. Cocking and W. E. Heath.

ROYAL ARMY MEDICAL CORPS.

TERRITORIAL ARMY.

Maj. W. Haig resigns his commn. and retains the rank of Maj. with permission to wear the prescribed uniform.

Capt. H. M. Anderson (late R.A.M.C.) to be Capt.

Lt. D. J. Davies to be Capt.

Capt. C. D. Walker to be Lt. and relinquishes the rank of Capt.

D. P. Levack, J. A. Stobbs, and T. H. Sansome to be Lts.

INDIAN MEDICAL SERVICE.

Lt.-Col. Chintaman Ramchandra Bakhle to be Col.

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS.

The quarterly meeting of the committee was held at 11, Chandos-street, on July 18th, when Colonel Mansell Moullin presided. The treasurer's quarterly statement was of a satisfactory character. In the Benevolent Branch five applications for help were renewed for a further year, the total amount being £278. In the Relief Branch one new case and four old cases were renewed, and grants amounting to £130 were renewed. One new case was considered, and the school fees, amounting to £30, were granted. The next meeting of the committee will take place in October, when the majority of the cases are again reviewed.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics for 1923 of three county boroughs in the Lancashire and West Riding industrial area. Some of the characteristic features of a "mill" town are illustrated in the table—viz., a low birth-rate, a high neonatal and infant mortality-rate, and high death-rates from childbirth and respiratory diseases:—

Name of county borough.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Blackburn ..	129,000	16·2	13·4	1·0	1·4	3·6	47	100	6·7
Stockport ..	125,700	17·6	12·7	1·2	1·3	3·0	34	92	4·1
Halifax	99,840	15·2	13·8	1·0	1·5	3·0	47	90	6·6

Blackburn.

In his very complete account of the activities of the Blackburn Health Department for 1923, Dr. W. Allen Daley has noteworthy events to record, while we mentioned in THE LANCET of July 19th (p. 127) the general lessons in relation to the cotton industry. In May an empty pavilion at the Corporation Hospital, with a playing field adjoining, was opened as an open-air residential school for 20 pretuberculous children with very successful results. Accommodation has also been made at the hospital for a day open-air class. In February an X ray apparatus was installed at the hospital, and has been found very useful in the diagnosis of suspected cases of tuberculosis of the lungs and thoracic glands, and also in gauging the effects of pneumothorax treatment, which was tried for the first time during the year, with encouraging results. In March an orthopædic clinic was begun. Monthly sessions are held by Dr. W. Briggs. Of the 75 patients dealt with, 25 were admitted to the Queen's Park Hospital of the guardians for operative treatment through the Crippled Children's Aid Society, which also provided extra nourishment, splints, and surgical appliances, and sent children to their Holiday Home.

In November the Springfield Maternity Home was opened. This is the successor to a six-bed home, opened by the corporation in August, 1921 (in coöperation with the Blackburn District Nursing Association). the success of which indicated that a long-felt need was being met. The new home was adapted from a large house in the best part of the town with nearly two acres of grounds, and has accommodation for 20. In view of the high maternal mortality from childbirth a special effort was made at the end of the year to arouse the interest of the midwives in antenatal work by the issue to them of certificates of efficiency. During 1923 only 97 mothers attended the antenatal clinic, and of these one was sent by a doctor and four by midwives. The results of the new effort is shown by the fact that there have been 78 new antenatal cases in the first quarter of 1924. A special clinic has been established during the year at a maternity and child welfare centre for the treatment of infants infected with venereal diseases, and their mothers. The clinic is conducted by Dr. Ella G. F. Mackenzie. Dr. Daley records the fact that the 208 blind persons in the town do not include a single blind child under 5 years of age, although 35 of the adult blind have been blind from infancy. In April a week's intensive campaign of publicity regarding venereal diseases took place and was a great success, large audiences being obtained. As regards education on health, Dr. Daley has two suggestions to make. First, there is a great lack of suitable cinematographic films on health subjects, and he thinks some central body should concern itself with the production of such. Secondly, he thinks such a central body might produce a monthly or quarterly health bulletin, to which local additions might be made, as is done in the case of parish magazines.

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[1] See THE LANCET, April 12th, 1924, p. 773.

Considerable efforts were made for the improvement of the milk-supply. The second clean milk competition for Alderman Fielding's Silver Cup was held from January to March. There were six entrants, all of whom reached a satisfactory standard. The unprogressive farmers held aloof or were actively hostile. Samples of milk from farms inside and outside the borough were examined for dirt. Of "inside" samples, 14 per cent. were grossly contaminated, and 8 per cent. were filthy. Of outside samples, 36 per cent. were grossly contaminated and 6 per cent. were filthy. Five out of 89 samples examined were found to contain living tubercle bacilli.

Stockport.

Dr. Arthur G. Jenner records two small outbreaks of scarlet fever. The one occurred in connexion with a private school, and probably originated with a mild unrecognised case of the disease. The other was traced to a milk-supply, the son of the milk vendor being among the patients. The milk in question came from an outside farm on which no source of infection was discovered, but there was a simultaneous outbreak in a neighbouring town, for which milk from the same district appeared to be responsible. The building of new houses shows some improvement. In 1923 176 new houses were built, and 125 more were in course of erection at the end of the year. The number built in previous years were: in 1918 and 1919, none; in 1920, 24; in 1921, 131; and in 1922, 71. The inspector found 21 tuberculous animals in the cowsheds, which were surrendered and destroyed. The examination of the mixed milk from six farms revealed one tuberculous sample and led to the destruction of one cow. No less than 32 of the 146 cases of tuberculosis which terminated fatally were unnotified at the time of death. The Stockport Corporation contract for beds at various sanatoriums —viz., 16 beds in the Cheshire Joint Sanatorium (recently opened), five beds at Wensleydale, and three at the Shropshire Orthopædic Hospital. They are also helped by the George Fearn Trust, which provides ten beds at the Ormerod Home, St. Anne's-on-Sea, for weakly and pretuberculous children. The same trust provides accommodation for weakly children at several farms in the vicinity of Stockport, with very beneficial results.

Halifax.

Dr. Cyril Banks discusses the high mortality from childbirth in view of Dr. Janet Campbell's recent report showing the bad position occupied by Halifax. He thinks that the increased facilities for admission to St. Luke's Maternity Home and the new maternity wards of the Royal Halifax Infirmary will be a step in the right direction, *provided* adequate medical supervision during the months of pregnancy can be insisted upon. He suggests that attendance at the antenatal clinic should be made a condition of admission to these lying-in wards. Such a condition is, we believe, already in force in the case of the lying-in wards of St. Thomas's and other hospitals with beneficial results. The Ministry has been asked to sanction the appointment of two additional health visitors in order to allow of increased antenatal visiting, better supervision of children from 1 to 5 years of age, an extension of tuberculosis visiting, and the transfer of the supervision of the mentally defective from the sanitary inspectors to the health visitors. Sanction has, however, only been given for one additional appointment. Tuberculosis after-care work is carried out in Halifax by a committee of the council of social welfare.

In her report on maternity and child welfare work, Dr. Alice Latchmore refers to the "handy-woman" difficulty. She also mentions that one "bona fide" midwife was removed from the Roll and a trained midwife censured for failing to call in medical aid in cases of ophthalmia neonatorum. Breast-feeding appears to be increasing; 60·5 per cent. of infants were breast-fed for six months in 1923, as compared with 54 per cent. in 1922. Dr. Banks is unable to report any appreciable improvement in the milk-supply. None of the special grades of milk designated in the Order of 1922 is on sale in Halifax. Halifax is evidently attacking the industrial smoke problem seriously, and a very interesting report is submitted by the smoke inspector, Mr. Herbert G. Clinch, whose book on the subject was recently reviewed in THE LANCET. The policy adopted in Halifax which is producing such satisfactory results is one of coöperation with owners and firemen, and many of the firms who have availed themselves of Mr. Clinch's expert advice have not only done away with the smoke nuisance, but have had the satisfaction of realising a considerable saving in fuel costs.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 19TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 42; scarlet fever, 1333; diphtheria, 694 (as against 654 of the previous week); enteric fever, 91 (as against 126 of the previous week); pneumonia, 570 (as against 497 of the previous week); puerperal fever, 26; cerebro-spinal fever 8; acute poliomyelitis, 27; acute polio-encephalitis, 1; encephalitis lethargica, 81 (as compared with 81 of the previous week); dysentery, 2; and ophthalmia neonatorum, 109. There were no cases of cholera, plague, typhus, or continued fever notified during the week. Of the 42 cases of small-pox, 8 were notified from the county of Derby (Chesterfield 3, Chesterfield R.D. 5), 1 from the county of Gloucester (Gloucester), 12 from Northumberland (Ashington), 4 from the county of Nottingham (Hucknall 3, Mansfield 1), 8 from Yorks, North Riding (Middlesbrough 5, Eston 3), 5 from Yorks, West Riding (Rotherham 4). Of the cases of encephalitis lethargica, 11 were notified from the County of London (Bermondsey 1, Bethnal Green 1, Camberwell 1, Greenwich 1, Hackney 1, Kensington 1, St. Marylebone 1, Shoreditch 2, Stepney 1, City of Westminster 1), 9 from the county of Durham (Sunderland 3, Sunderland R.D. 2), 14 from the county of Lancaster (Liverpool 5, Manchester 4), 8 from the county of Warwick (Birmingham 7, Nuneaton 1), 4 from Yorks, West Riding (Sheffield 2), and 1 from the city of York.

Deaths.—In the aggregate of the great towns there was a decrease of 174 in the total deaths for the week under review. In London the number of deaths from all causes decreased from 763 to 752, while the deaths from diphtheria numbered 8, as compared to 7, 5, and 9 in the preceding three weeks.

BLIND MASSEURS.—The fifth annual report of the Association of Certificated Blind Masseurs records continued progress during the year which ended on June 30th, and the executive council gratefully acknowledge the help which they have received from the President, Sir Robert Armstrong-Jones, from St. Dunstan's Hostel, and from the National Institute for the Blind. The Association now has 173 members, composed of 92 blinded soldier masseurs, 38 civilian masseurs, and 43 masseuses. They are practising in 42 districts of London, 72 provincial towns in England, Wales, Scotland, and Ireland, and in some of the principal towns in Australia, New Zealand, Canada, South Africa, and South America. The address of the Association is 224, Great Portland-street, London, W. 1.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 192.)

REPRESENTATIVE MEETING.

SATURDAY, JULY 19TH.

HOSPITAL POLICY OF THE ASSOCIATION.

As briefly noted in our report last week the afternoon session of this day was occupied with a momentous debate on the policy of the Association in regard to remuneration of the medical staffs of voluntary hospitals. It will be remembered that the subject was fully discussed at the representative meeting in 1923, when a motion to postpone decision was proposed by a member of the Council and passed by a small majority. The subject was now reintroduced on a motion by Mr. N. BISHOP HARMAN, (late) Chairman of the Hospitals Committee, to rescind para. 10 of the scheduled hospital policy as no longer applicable, and to substitute a new form of words fitting the new situation. The old paragraph runs :—

> Gratuitous contributions to hospitals by employers of labour or by employees should not be treated as the payment of premiums for insurance against the cost of maintenance and medical treatment for sickness or accident, nor as entitling the contributors to claim hospital treatment either for themselves or for persons nominated by them, but as charitable contributions to be expended at the discretion of those to whom the management of the hospital is entrusted.

Mr. Harman, on behalf of the Hospitals Committee, now proposed to substitute the brief declaration :—

> Contributions to hospitals by employers of labour or massed or periodical contributions by employees should be considered as contributions for services rendered or to be rendered.

Mr. Harman, in moving the resolution, spoke of the increasing interest which was being taken in hospital administration, as shown by the steady flow of inquiries he received. Recently they had been working in coöperation with the British Hospitals Association. During the past year a questionnaire had been issued to 912 hospitals in England and Wales in the following terms :—

Staff Fund Questionnaire.

1. Does the hospital enter into arrangements for the treatment of State, municipal, and similar patients—e.g., Ministry of Pensions, War Office, Board of Education, Ministry of Health, Admiralty, municipal or other local authority?

2. Do the members of the medical staff receive any form of remuneration in respect of above? If so, in what form? (a) Directly from the authority concerned? (b) Honorarium? (c) Staff fund?

3. Does the hospital receive payments from employers of labour, approved societies, or insurance companies in respect of patients?

4. Do the members of the medical staff receive any form of remuneration in respect of above? If so, in what form?

5. Does the hospital receive payment through a contributory scheme in which there is a stated return—e.g., contributory insurance scheme?

6. Do the members of the medical staff receive any form of remuneration in respect of above? If so, in what form?

7. Does the hospital receive payment through a contributory scheme in which there is an implied return—e.g., workers' mass or periodical contributions?

8. Do the members of the medical staff receive any form of remuneration in respect of above. If so, in what form?

9. Is there any system of inquiry into the means of each patient?

Nearly one-half of the hospitals had responded with information, from which it appeared that (1) of 237 hospitals entering into arrangements for the treatment of State, municipal, and similar patients, in 73 per cent. some remuneration was being paid to the medical staff; (2) of 217 hospitals receiving payments from employers of labour, approved societies, or insurance companies, in 7 per cent. some remuneration was paid; (3) of 62 hospitals receiving payments through contributory schemes with stated return, in 11 per cent. some remuneration was paid: (4) of 110 hospitals receiving payments through contributory schemes with implied return, in 11 per cent. some remuneration was being paid to the medical staff. Taking the four categories together, the inquiry showed that in 25·6 per cent. of hospitals some form of pecuniary recognition was already being made to members of the medical staff.

Capital Value of Staff Services.

The Hospitals Committee, Mr. Harman went on, desired to find conditions that would cover all circumstances, from those of the little cottage hospital to those of the teaching hospital. The keynote of their policy was that it was never in the imperative mood; it was always in the persuasive mood. When the policy of the Association was expounded to hospital administrative officers he found that they were not in the least hostile, but recognised that the principles were fair and just, although at the moment funds might not permit of any such change. The work of hospital staffs was often eulogised, but few people, he thought, fully realised its value to the community at large. A former chairman of that representative meeting calculated that at his hospital at Cardiff the work of the staff was worth £350,000 a year to the community: on the same basis the cash value of the work of the medical staffs of hospitals in England and Wales worked out at £54,000,000 a year. His belief was that voluntary hospitals to-day were better than ever they had been, and that they were destined to be better still. The Association was striving to secure a succession of men, who would carry on the work as their fathers did. He reminded them of the "bidding prayer" heard when the Association met at Cambridge, and said he would like to make a medical version of it: "That there may never be wanting a succession of skilful and devoted men to serve God and the nation in the hospitals of this country, let us work to establish a sure foundation and defence for the generations that are to come." It was wrong that large sums paid to hospitals by friendly societies and large industrial undertakings should come in under the old para. 10. Para. 10 as it stood was effete, and should be replaced by something that met the situation to-day.

A Vote on the Principle.

In the discussion that followed the Chairman allowed individual members a very wide liberty, as he said, "to let off steam." It was argued on the one side that to pass this resolution would make difficulty by involving medical staffs of hospitals in a definite contract which they would be bound to fulfil; that the staff under the voluntary system could not expect all the advantages of State or municipal officers ("if you want salaries say so, but you will cease to be honorary officers"); that in Scotland, at all events, there was no lack of competition for honorary positions, successful applicants well knowing that in the fulness of time there would be a much larger return than in general practice. On the other side it was pointed out that voluntary hospitals now contained only 5 to 10 per cent. of the class for whom they were originally intended: that when a business firm contributed £1000 a year to a hospital it meant "we expect you to look after our staff": that five guineas a week was now quite a usual charge to hospital patients, and that working men when they realised the situation would themselves prefer to pay the staff a fair wage for a fair day's work. All that could be said on the one side or the other was said and well said. The voting on the resolution was taken by roll-call, when there were 87 ayes, 19 noes, and 12 abstentions. The requisite two-thirds majority not being obtained, the Chairman stated that the motion was a resolution by the Representative Body and not a declaration of policy of the Association.

Taxing of Massed Contributions.

In proposing the next resolution Mr. HARMAN asked the meeting to bear in mind the various categories in which payments received by hospital authorities on behalf of patients were made. The representative meeting had already defined its policy in regard to contributions received under contract between the hospital and an employer (the State, a statutory authority, or an insurance committee) on behalf of persons for whom it was responsible. That was the highest form of arrangement by which payments were made to a hospital. A second form was where a third party contributed towards treatment without actual contract. A third form was where the patient or his friends paid for what was done for him. It had been agreed times out of number that when there was a contractual arrangement of the first category some portion of that money should be credited to the staff, and it had also been agreed that this was to be done through the staff fund. The position was not quite so clear as to how contributions made by approved societies or contributory schemes should be treated. Several members of his committee were in favour of the recognition of staff services, but not through staff funds for local reasons which made it difficult. It had been suggested, therefore, that the remuneration could be either in the form of an agreed honorarium or through a staff fund.

After discussion on familiar lines, during which the phraseology of the resolution was modified to meet various objections, it was put and carried thus:—

> Where the board of management of a voluntary hospital accepts contributions for patients from an approved society, insurance company, contributory scheme, employer of labour, and/or by massed or periodical payments by employees, the members of the visiting medical staff should receive recognition of their services either in the form of an agreed honorarium, or by means of a percentage of all such payments being passed into a fund. Such honorarium or fund can be allocated in any manner which the visiting medical staff may determine.

Monday, July 21st.

Taxing of Individual Payments.

The principle of payment of hospital staff was carried a stage further by a resolution proposed on behalf of the Hospitals Committee by Mr. **Harman**:—

> Where the board of a voluntary hospital accepts payments from individual patients [other than paying patients referred to in Sections IX. (*a*) and IX. (*b*)] the members of the visiting medical staff should receive recognition of their services either in the form of an agreed honorarium or by means of a percentage of all such payments being passed into a special fund. Such honorarium or fund can be allocated in any manner which the visiting medical staff may determine.

This resolution, said Mr. Harman, was the keystone of the arch of the Association's hospital policy. Unless that resolution were carried the whole fabric would gradually fall in. This policy would protect all and sundry from being tempted to do that which was not quite straight. Unless this resolution were on the books, requiring some form of assessment of payments by individual patients, inevitably it meant that all those patients sent by the State, all those sent by employers of labour or under contributory schemes of approved societies and insurance companies, would be required to make their own arrangements; they would be sent to the hospital and told to pay the charges of the institution, and when they returned to their homes the thing would be squared up as between the patient and the approved society or other body.

Mr. Harman believed that this resolution made for justice and equity as between different classes of the community. To-day a large proportion of the work of those consultants who were attached to hospitals was given without any remuneration whatever. It had been said by one consultant that three-fourths of his work was done free. That meant that the consultant was charging all the cost of that three-fourths of his work to the remaining quarter of his patients—"the Robin Hood method," Mr. Harman called it. But the manual worker in these days was not a helot; he had a good time, thanks to what the brain-worker had done for him. At the moment the boot was on the other foot; the brunt fell on the brain-worker, whose wages had not increased in proportion to those of the manual worker. By this method of making all the costs of the consultant fall on a quarter of his patients they were causing the brain-workers to pay for the hospital treatment of the manual worker. If this were put to the manual worker he would say at once that it was not fair and that he did not want it.

Payment not "Repugnant."

On an amendment by Bolton that such taxation of voluntary payments by individual patients was repugnant to the hospital staffs, Dr. J. C. **Matthews** pointed out the possibility of a hospital charging its patients enough to carry on without the aid of voluntary contributions at all, and the absurdity then of an unpaid staff. Dr. P. **Macdonald** created amusement by including himself among the number of those who had a subconscious vested interest in voluntaryism. He did a large part of his work at hospital, and made his living by charging those people who were unfortunate enough to have to consult him larger fees than they could afford. From the South it was pointed out that the staff fund suggestion was terribly disliked, and if pushed would lead to withdrawal from membership. The amendment was lost by a large majority.

"Not Recoverable from Third Parties."

An amendment was then proposed by Dr. E. R. **Fothergill** (Brighton) to exclude from the scope of the resolution payments which could be recovered from third parties:—

> Where the board of a voluntary hospital accepts payments from individual patients [other than paying patients referred to in Sections IX. (*a*) and IX. (*b*)] *not recoverable from third parties* which are insufficient to pay more than the total average cost to the hospital, such payments shall not be liable for assessment for visiting medical staff fund purposes; but some form of recognition should be made to the visiting medical staff from all other such payments by way of an agreed percentage in the case of a public authority, and by an honorarium or otherwise in all other instances.

Dr. Fothergill spoke of the differing conditions in North and South; in the North the taxing of individual contributions might be necessary to avoid exploitation, in the South it would be considered mercenary by many. In any case, it would be wiser to postpone decision since hospital benefit was likely to be brought by the Royal Commission within the National Insurance scheme. Mr. W. **McAdam Eccles** explained how the antagonism to medical staff funds was disappearing in London. One reason for this was that members of voluntary hospital staffs who had been receiving an honorarium in respect of their motor-car or telephone had had to concede that they were receiving that honorarium out of the ordinary funds of the hospital. Secondly, payment up to a "maintenance" limit was not necessarily "voluntary"; there were some hospitals which laid it down that payment "must" be made. And finally, there was another consideration which counted for much. The majority of patients did actually believe that the payments they made to the hospital, either voluntarily or on request, were made for two specific purposes—namely, partly for their maintenance in hospital and partly for the treatment they were receiving. Therefore they were right in asking for a proportion to be handed over to the medical staff fund. Mr. F. C. **Pybus** (Newcastle) said that the hospitals in the North must safeguard themselves against mass contributors, and that owing to increasing decentralisation the surgeon would have to look more and more to the hospital for his livelihood. Dr. **Christine Murrell** (London) called it almost unfair to the patient who paid a contribution to a hospital not to allow some portion of it to go to the doctor. She was sure the manual worker did not wish his treatment to be paid for by the brain-worker. Dr. T. W. **Lipscomb** (New South Wales) was afraid that if the resolution was carried it would be found to embarrass the profession overseas. Some of them who had had experience of Labour Governments felt that the best way to avert nationalisation of hospitals—which they did not want—was the retention of their status as honorary officials. He would restrict admittance to the actual "sick poor"—those unable to obtain adequate attendance in their own homes, when the urgency would disappear. Dr. E. W. G. MASTERMAN remarked that in all Government institutions the term "maintenance" included the salaries of the medical staff. Dr. N. MACFADYEN (East Herts) said that if that resolution were carried it meant that in theory, at least, the voluntary system was dead, and they were no longer free agents. Theirs was essentially a charitable profession. A large element in the country could not pay a proper amount for treatment, and until that portion of the population was in a better position it should be assisted by the charity of the public and to some extent by the charity of the medical profession. Dr. J. D. COMRIE said that in Edinburgh also there had been a change of view on the part of the hospital medical staffs. In the ordinary hospitals they were no longer dealing with the "sick poor"—who were to be found in the Poor-law infirmaries—but with the well-to-do artisan class who were able, and often anxious, to contribute to the hospital. Dr. C. BUTTAR agreed with Australia; it was not good tactics to fight Labour control by taking Labour money. Mr. SOUTTAR thought the adoption of the resolution would render the whole hospital policy nugatory. It was almost impossible to ascertain whether the payments of patients were personal or not. It had been suggested that a way out of the difficulty would be to limit hospital admission to hospitals to the "sick poor," but they had no right to do that. How many nursing homes in the country were equipped with X ray apparatus? What right had they to exclude those who had put by a little money and who stood in need of treatment which could only be obtained at a hospital?

Dr. Brackenbury Sums Up.

We have reported at some length the discussion on Dr. Fothergill's amendment, for it was the final stage in what no doubt will come to be regarded as an historic decision, and all shades of opinion were well represented and clearly expressed. Before Mr. Harman replied for the Hospitals Committee, Dr. BRACKENBURY set out with admirable precision the essential elements of the situation. The point, he said, they had to decide was whether personal contributions from patients which did not reach the level of the cost of maintenance ought or ought not to be ear-marked for contributions to the State fund. He had previously spoken on the side of those who thought that such a contribution ought not to be so ear-marked. Like Sir Richard Luce, he had been converted. In the first place, the hospitals were in a better financial position than they were two years ago, and he did not think medical men would be so liable to be accused of putting into the pockets of the profession something which the hospitals desperately needed in order to enable them to carry on at all. Then the proposal now put forward was that there should be "an agreed honorarium," which was a very different thing from saying that 20 per cent. should be passed into the staff fund. That was one of the things which had enabled him to come round to its support. But he had also been impressed by the volume of evidence that had come to him, especially from the North of England, that there was a great deal of subterfuge actually going on in this matter. There were societies and employers and combinations of workpeople who were sending people into hospitals and saying: "We will let you pay the subscription to the hospital and we shall then be able to get off without paying this contribution to the staff." He therefore thought it dangerous to draw a line between massed contributions and individual contributions. Then there were many people who could contribute something above the cost of maintenance and did, in fact, contribute something below the cost of maintenance. He was convinced that the distinction between a personal contribution above the cost of maintenance and one not above the cost of maintenance was impracticable to obtain. He doubted if the motion in fact did what its proposer intended it to do. The motion read "not recoverable from third parties." He did not see how it could be discovered in individual cases all over the country whether a contribution given was or was not recoverable from, or provided by, somebody else. If that could not be discovered, then it was better to have the simple clear-cut policy—that all these contributions should be ear-marked in some way, and to some degree, as a recognition of the services of the hospital staff, even if in a particular hospital the staff desired only a nominal honorarium which they could give back to the hospital if they liked.

Mr. HARMAN said that the policy was not intended to apply to Australia, where there were four different classes of hospital—known as departmental, committee, intermediate, and private—which did not correspond in essential ways to conditions in Britain. The Brighton amendment having been put to the meeting and lost by a large majority, the resolution was carried by the necessary two-thirds majority and becomes the policy of the Association.

"Super-Contributory" Schemes.

Mr. HARMAN then suggested that in the event of proposals being made to establish contributory schemes to provide in-patient treatment for those referred to in the hospital policy of the Association as "private patients" and yet who are unable to pay individually at the time of illness for these benefits, such schemes shall provide as follows:—

(*a*) An income limit scale such as is approved by the majority of the medical profession resident and practising within the area of the scheme.

(*b*) The accommodation provided for in-patient treatment to be at recognised nursing homes, paying hospitals, or in accommodation of the nature of a nursing home in connexion with a voluntary hospital.

(*c*) Patients should be admitted to the benefits of the scheme only on the recommendation of a private practitioner, except in cases of emergency.

(*d*) Free choice of doctor (attendant and specialist) by the patient subject to the consent of the doctor to act.

(*e*) The scheme to be administered by a general committee representative of all the interests concerned—medical, hospital, and lay—and not by any voluntary hospital or other coöperating institution.

(*f*) The method of remuneration of medical specialists to be payment for work done on the terms customary for such patients in each area.

(*g*) Any provision made under such schemes for consultation and specialist's services apart from in-patient treatment shall be arranged for at the consulting rooms of the chosen consultant or at the home of the patient on terms customary for such patients in the area of the scheme, and not in any out-patient department of any institution.

This proposal was carried without further discussion.

Standards of Hospital Provision.

Mr. HARMAN then suggested that it would be well for the Association to lay down certain approved standards for hospitals in England and Wales, with 100 or more beds, on the basis of the information obtained by the Hospitals Committee. And with very little hesitation the following standards were accepted:—

(*a*) In every such hospital the visiting staff should be of recognised competency and should be proportionate to the number of beds in the hospital: a suitable ratio is about 1 to every 25 beds, or where out-patient departments exist the ratio of staff should be greater.

(*b*) In every such hospital recognised arrangements should exist for obtaining the services of registered practitioners experienced in (*a*) anæsthesia; (*b*) dental surgery; (*c*) dermatology; (*d*) diseases of the ear, nose, and throat; (*e*) electrology; (*f*) gynæcology; and (*g*) ophthalmology.

(*c*) In every such hospital there should be recognised departments for radiology, medical electricity, and massage.

(*d*) In every such hospital there should be provision, wherever useful and possible, for the services of clinical assistants.

(*e*) In every such hospital there should be at least one resident officer to every 50 beds.

(*f*) In every such hospital there should be staff meetings for discussion of clinical work at least once a month, and an analysis of the hospital work should be presented at each meeting.

(g) Every such hospital should have an efficient clinical laboratory with a recognised pathologist in charge.

(h) In every such hospital case records should be kept in respect of every patient, and these should be signed by the member of the staff responsible for the case; these records should be filed and indexed by a competent clerk; every effort should be made to obtain the subsequent medical history of each patient.

(i) There should be exchanges of information between the patient's medical attendant and the hospital medical staff.

Note.—To all letters issued by medical members of hospital staffs the following note should be appended: "The information contained in this letter is strictly private and confidential to the person to whom it is addressed, and must not be divulged without the consent of the writer."

(j) Every such hospital should employ a registered pharmacist.

(k) Every such hospital should be a recognised training school for nurses, and should have, or be associated with, a preliminary training school.

Formation of Local Hospital Committees.

The last act of the retiring chairman of the Hospitals Committee was to propose a scheme for the formation within the Association of local hospital committees for the purpose of organising local professional opinion as to hospital medical service. These committees, elected half by members of hospital staffs and half by the branch council, are to consider all arrangements made in connexion with local hospital conditions and all disputes arising in connexion therewith. The proposal was accepted without discussion, and Mr. Harman on leaving the platform received warm congratulation on the conclusion of his work.

TUESDAY, JULY 22ND.

AFFILIATION OF THE CANADIAN MEDICAL ASSOCIATION.

On behalf of himself and his co-delegate, Dr. Alfred Cox, Sir T. **JENNER VERRALL** presented a report on their Canadian mission. In Canada the Association had never, for some reason or another, had the same hold on the profession that it had had in other parts of the Empire. Two successful annual meetings had been held, one at Montreal in 1897, the other at Toronto in 1906, but at the present time, out of a medical population of about 9000 in Canada, there were only 374 members of the British Medical Association, and the five branches existed only on paper. In these circumstances the suggestion of a possible affiliation led to a warm invitation from the Canadian Association to send delegates to discuss the question, accompanied by a pressing invitation to hold the annual meeting of the Association at Winnipeg in 1927. The mission found on the part of the Canadian medical profession an extreme readiness to accept a proposal for affiliation. Meetings were held at Quebec, Montreal, Toronto, and Ottawa, where the desire for closer union was explained and a scheme of affiliation formally adopted by the Canadian Association. Affiliation, he recognised, was in no sense an equivalent to membership in the British Association, but it gave an opportunity for coöperation, for reciprocal visits, and for tendering advice as medical policy developed in Canada.

Dr. **COX** spoke of their reception in Canada, where they were almost killed with kindness. The meeting endorsed the report, thanking the delegates for their services, and on the suggestion of the Chairman a message was sent by the meeting to the Canadian Medical Association expressing pleasure that the twenty-first meeting of the Representative Body should have been marked by the setting in motion of a scheme for closer relationship with their Canadian brethren.

INDIRECT ADVERTISING.

ON behalf of the Central Ethical Committee Dr. R. L. **LANGDON-DOWN** (South Middlesex), chairman of the Committee, moved the adoption of the very careful report on Indirect Methods of Advertising which we reproduce at length on page 246. Dr. Langdon-Down began by defining the two possible attitudes in regard to advertisement by medical men. Either complete freedom could be given or certain restrictions could be enforced by professional opinion or by professional law. He regarded the discountenancing of advertising methods as specially desirable on grounds of public interest. The basis of professional reputation should not be the self-praise of the individual, nor the appreciation of those who were poorly qualified to judge or who based their approval on unworthy or biassed grounds, nor should it depend on the frequency of the appearance of the practitioner's name in the public press, with or without photograph and appropriate headlines. Professional reputation should be soundly based on the esteem of colleagues and on solid, quiet work. Restrictions if made must of course be applied all round, and he went on to outline the relations of the Association with the General Medical Council and the more searching character of the Warning Notice issued as a result of their representations and Dr. Bolam's intervention in the Council. The policy of the Association was to treat the subject of advertising as a live part of professional law with no distinction between practitioner and consultant, and they had tried to harmonise the new law against indirect advertising with the exigencies of life and practice. The principle was easy, the application difficult; and he besought the meeting at all events to accept the general policy laid down in the report.

Dr. **FOTHERGILL** moved an amendment that, in view of no distinction being made in the report between intra- and extra-professional advertising, it should be referred back to the Committee for revision. They were all heartily in favour of something being done to stop the blatant kind of advertisement that was going on, and his own wish was to ask the press to coöperate. The reputable press did not want to advertise the inferior practitioner but it did sometimes desire to have adequate medical opinion on a matter of importance. If, he said, you allow a doctor to talk openly of birth control at a Church Congress, why not allow him an article over his own name in the public press? The public could see no distinction. The report suggested that a statement without signature would be of equal value. But was it? Certainly, readers would regard it as coming with more weight from Dr. So-and-So. The alternative would be for the Association itself to arrange for the issue of efficient statements on questions of moment, the information to be given in the name of the local division and not in the name of any individual. Should the ethical question then be raised, the Association would be in a position to say to the individual doctor: "Your opinion is not required: we have a scheme to inform the public adequately."

Dr. **BRACKENBURY** agreed that an anonymous letter did not in fact carry the authority of one that was signed. In this respect the report would have either too much effect or none at all. On important occasions they had agreed that certain doctors should write to the press. The iniquity consisted not in the name but in the address and photograph. Journalists were naturally apt to look at the matter not from the point of view of the medical profession but from their own, and they would put in your photograph ("or some one else's, with your name under it") without consulting the writer. "Some of us," he said, "suffer; but some of us do not mind. Personally, I suffer." He hoped that this part of the report would be referred back for consideration.

Dr. P. **MACDONALD** concurred, for he believed that on this point they would not carry the public with them.

Sir **JENNER VERRALL** regarded Dr. Fothergill's suggestion as impracticable. It was a question of speed. Answers would not be obtained in time from the division, and in the long run the public would remain unsatisfied. It was hardly correct to suggest that the medical man was tempted by the press; "what he does he does for his own advantage." The General Medical Council could not lay down any strict letter of law, but it was equivalent to a jury of common-sense men who could decide in a particular case whether that was the kind of thing the medical man ought to have done. It should be possible to check erring brethren without depriving the public of legitimate information.

Dr. Langdon-Down was glad that no serious attack was made on the principles enunciated; Dr. Fothergill was in fact wanting the same thing as the framers of the report. Advertisement consisted of two parts—the act and the motive; it had been their endeavour to direct motives and to leave the General Medical Council to deal with practice. Where information, he said, is a question of fact, it matters not who writes it; only as an opinion did the name matter. In examining books on semi-medical topics the Ethical Committee always required that neither address nor portrait should appear and discouraged the elaboration of appointments and titles. But he was quite willing to take the paragraph back for consideration,

Dr. Bolam, as chairman of the B.M.A. Council, asked for endorsement or the reverse of the report as a whole. There was not merely passive resistance to encounter but actual defiance of what they thought was the proper professional ethic.

Mr. Bishop Harman described the report as good in the main, but impracticable and wrong in one particular. Surely the weight of a communication was in proportion to the personality behind it. An anonymous letter might readily fail of its effect. He recalled the incident of a brilliant letter addressed to the *Times* over the signature "Veritas" which made scarcely a ripple on the surface. "I wrote a letter and signed it with my own name," he said, "and it went to Hongkong and back." "If I read in a paper 'on eminent medical authority,' I turn the page at once, and so does the intelligent part of the public." There was a celebrated saying that in a speech three things mattered: what is said; how it is said; and who says it—and the last was the only thing that really mattered. It was much the same with articles and interviews. What was the good of a love letter if it was not signed?

After a very full discussion the meeting expressed agreement with the report as a whole, referring back for further consideration the section relating to the discussion in the papers of matters of public interest by letter, article or interview.

Election of Eight Members of Council.

Eight members of the Council were elected by representatives on the principle of the single transferable vote, the names being Dr. H. G. Dain, Mr. W. McAdam Eccles, Dr. E. R. Fothergill, Dr. R. L. Langdon-Down, Dr. J. A. Macdonald, Dr. G. W. Miller, Dr. C. Sanders.

ANNUAL GENERAL MEETING.

TUESDAY, JULY 22ND.

The annual general meeting was held in the Technical College at 2 P.M., when the outgoing President, Mr. C. P. Childe, inducted Mr. J. Basil Hall into the presidential chair and invested him with the badge of office. After the statutory business the President reported that Dr. F. G. Thomson, consulting physician to the Royal Mineral Water Hospital, Bath, had been elected President of the Association for the year 1925-26, in place of the late Mr. Forbes Fraser. Dr. Bolam proposed a vote of thanks to the retiring President. Not often, he said, had the Association enjoyed a President who entered so keenly and in such detail into its work, or one who found time in a busy life for so much civic activity. Mr. Childe, in responding, remarked that his year of office had been of great educational value to him; it was a pity that all members could not become presidents. He reviewed his year of office with special mention of the large amount of voluntary work done by members of the Council. At the evening adjournment in the Regent Picture House, attended by members in academic and official dress, the President was accompanied on the platform by the Lord Mayor of Bradford, the Archdeacon of Bradford (Canon Stanton Jones), and other prominent citizens. He welcomed the delegates from Overseas, introduced to him by Dr. W. N. West Watson, local general secretary. Among these were:—

Major J. Morison, I.M.S. and Dr. R. Row (Bombay), Dr. A. N. Coomarasamy (Ceylon), Dr. O. Marriott (Hong-Kong), Dr. A. C. Lankester (Hyderabad). Dr. K. A. W. Procter (Kenya), Dr. A. L. Hoops and Sir Malcolm Watson (Malaya), Dr. Gordon W. Spencer (Mesopotamia), Dr. A. J. Spiller Brandon and Dr. Norman Dowling (N.S.W.). Dr. J. A. Doctor, Dr. A. W. Izard. Dr. W. B. Mercer, Dr. P. T. Putnam (N.Z.), Mr. P. N. Yellacott (Orange Free State), Dr. R. F. Matters (South Australia). Dr. J. B. Davey (Tanganyika). Dr. T. W. Sinclair (Victoria), Dr. J. J. Holland (Western Australia), Dr. L. G. Irvine, and Dr. J. H. Harvey Pirie (Witwatersrand).

Dr. Bolam then handed the *Stewart Prize* of the Association to Dr. Edward Mellanby, professor of pharmacology in the University of Sheffield, for important discoveries in the relation between rickets and dietetic deficiency. The President remarked on the appropriateness of the presentation in Bradford, which was the first city to set the feeding of school children on a municipal basis. The *Gold Medal* of the Association was then handed by the President to Dr. H. B. Brackenbury, chairman-elect of the Representative Body, for arduous and distinguished services to the Association and the medical profession. The testimonial was inscribed in an illuminated album. Mr. Hall spoke of Dr. Brackenbury's services to the medical profession in the controversy regarding panel practice, recalling the admiration expressed by the Government Advocate for the moderate and public-spirited manner in which Dr. Brackenbury conducted his case.

The President then delivered the address which appeared at the front of the last issue of THE LANCET, and, this done, the guests adjourned to a reception in the spacious rooms of the Cartwright Hall, where the forecourt was tastefully illuminated, and a very pleasant social evening was spent.

THE ANNUAL DINNER.

The annual dinner was held at the Midland Hotel on Thursday, July 24th, Mr. J. Basil Hall presiding. After the loyal toast had been honoured, the President handed to Dr. J. Henderson (Glasgow) the Ulster cup, and to Dr. J. J. Buchan, medical officer of health for Bradford, the Childe cup, both won on the Hawksworth Links. Dr. Brackenbury, in proposing "The City of Bradford," said that there was more in civic life than mere comforts. The health of a town depended to a large extent on the city fathers. And just as the medical profession should not go outside its professional sphere and interfere in activities not theirs, so it would be a lamentable thing for a big corporation to ride rough-shod over the beliefs and traditions of the practitioners in the town. Only by active and willing coöperation could the health of a city be effectually secured. Sir William Priestley, in replying, pictured the changes seen during the last 50 years in the conditions under which the people lived and worked in Bradford. Archdeacon Stanton Jones proposed "The British Medical Association," remarking that the physical and spiritual realms were drawing closer, and it was difficult to say where the work of one began and the other ended. He hoped the day would never come when the doctor became a State official, and he trusted the Association would put its strength on the side of the righteous forces of the nation. Dr. Bolam, in replying, said they were prepared to place their experience and knowledge at the service of any political party in office which took (*g*) Every such hospital should have an efficient clinical laboratory with a recognised pathologist in charge.

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Sir JENNER VERRALL regarded Dr. Fothergill's suggestion as impracticable. It was a question of speed. Answers would not be obtained in time from the division, and in the long run the public would remain unsatisfied. It was hardly correct to suggest that the medical man was tempted by the press; "what he does he does for his own advantage." The General Medical Council could not lay down any commending or directing attention to the practitioner's professional skill, knowledge, services, or qualifications, or depreciating those of others; or of being associated with or employed by those who procure or sanction such advertising or publication, and

(b) Of canvassing or employing any agent or canvasser for the purpose of obtaining patients; or of sanctioning or of being associated with or employed by those who sanction such employment;

are in the opinion of the Council contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner who resorts to any such practice renders himself liable on proof of the facts to have his name erased from the Medical Register.

The Newer Methods of Advertising.

Examples of the newer methods are to be found in interviews granted to newspaper representatives, and in signed letters or articles sent to newspapers. In many of these, members of the profession, either by the direct assertion of the journalists concerned, or by more indirect methods, are referred to as possessing, or allow it to be inferred from their own words that they possess, methods of treatment superior to those practised by others. In the opinion of the Committee the word "advertising" in connexion with the medical profession must be taken in its broadest sense, to include all those ways by which a person is made publicly known, either by himself, or by others without his objection, in a manner which can fairly be regarded as "for the purpose of obtaining patients or promoting his own professional advantage."

Accepted Customs.

It is generally accepted by the profession that certain customs are so universally practised that it cannot be said that they are for the person's own advantage, as, for instance, a door-plate with the simple announcement of the doctor's name and profession. Even this, however, may be abused by undue particularity or elaboration.

Intra-Professional Channels.—It is commonly agreed that channels must be open for discussion between members of the profession for recording the results of research and clinical experience and for bringing to the notice of other members books published and facilities for treatment offered. The recognised channels are medical societies, medical periodicals, and works primarily intended for the medical profession. The information so given is intended for the convenience and advantage of the profession, which will be in a position to judge of the value of the information and of the manner in which it is conveyed. Even this legitimate kind of advertisement is capable of abuse.

The Medical Man as Citizen.—It is the recognised duty and right of a medical man to take his share as a citizen in public life, but there is no reason why this should involve any advertisement of himself as a doctor, and, with due care, improper advertisement can be avoided.

Publicity as an Official Duty.—Publicity is rightly allowed to medical men not in actual practice of their profession since they cannot be regarded as using this publicity for the purpose of promoting their own professional advantage, and in view of the official position of medical officers of health and other medical men who hold posts in either the public health or other public service, publicity is sometimes not only permissible but necessary for the fulfilment of their official duty. The presumption in all these cases is that publicity is not sought for the individual's own gain though it is possible that the practice might be abused and the presumption therefore fail. [illegible]

Books and Lectures.—The publication of books and the delivery of lectures on semi-medical topics which are of general public interest and require medical knowledge for their proper presentation have been recognised as legitimate, subject to the avoidance of methods which tend to the personal professional advantage of their authors. There are many things innocent in themselves which may, by the manner and frequency of their doing, gravely contravene the principle that medical practitioners should not advertise.

Letters to the Press: Signed or Unsigned.

From time to time there are discussed in the papers matters of great public interest or importance regarding which it is to the advantage of the public that the medical considerations involved should be stated either by letter, article, or interview. If the only object in view is the proper instruction of the public, it is not necessary that the names of the medical writers or informants should be given. The newspapers can give the necessary assurance to their readers as to the professional standing of the authority quoted without mentioning names. If the journal were dissatisfied with this course it would probably be due to a desire to satisfy the curiosity of his readers about personalities rather than to a desire to instruct them on important matters. But even from the journalist's point of view adherence to the practice suggested would give him better results, since it would place at his disposal the opinions of men of greater standing and experience than are available now when names are allowed to be bandied about in public. There may be rare exceptions to this rule of anonymity as when a doctor is himself a principal actor in the circumstances under review. His intervention may be necessary, and would be meaningless if anonymous. In this case the publicity given has already been necessary on public grounds.

Speaking generally, it may be said that the medical men most often quoted in the press are not those whose opinions carry most weight with the medical profession or with the educated public. It is natural that those whom the press representatives most eagerly seek to draw into their service and utilise for their own advantage are those who have some recognised position or well-sounding address or title. It is, therefore, especially important that a stand should be made by such practitioners, who perhaps do not realise that the example set by them may well be pleaded in justification by those in a less prominent position.

Attitude of the Association.

After making all allowances for all those modes of publicity for which there may be some justification, there remain many instances which can only be regarded as gravely and unnecessarily contravening the spirit of the notice of the G.M.C. The Association is convinced that in taking up an attitude of determined opposition to these undesirable journalistic methods the Association is acting in the best interests of the public as well as of the medical profession. The extension of the system can only lead to a competition for public notice in which the abler and more scrupulous men would be left behind by those who professionally are greatly inferior, to the detriment of the public, who are ill-qualified to judge of the true worth of scientific opinions. The extension of the advertising habit among the profession in general would certainly destroy those traditions of dignity and self-respect which have helped to give the British medical profession its present high status, and would gravely undermine the amenities and harmonious working of medical practice.

The Honour of the Profession.

The Association, therefore, draws the attention of the profession to the danger of these objectionable methods, and insists upon the urgent need that every member of the profession who values its honour should offer a firm resistance to these insidious developments. If only those whose reputation is mainly derived from the newspapers allow their names and opinions to be quoted or to appear as those of "the eminent" physician, surgeon, or specialist, the practice will die a natural death.

what the medical profession conceived to be the right path. Dr. Wallace Henry proposed "The Guests," to which Prof. van den Bergh (Utrecht) responded. Mr. Hall, in conclusion, spoke with gratitude of the many groups whose help had contributed to the success of the gathering in Bradford.

THE PATHOLOGICAL MUSEUM.

A series of interesting exhibits were set out in the biological laboratory of the Technical College under the direction of a committee of which Dr. M. A. C. Bucknell was hon. secretary. Mr. Basil Hall showed specimens illustrating the surgery of the colon; Prof. F. W. Eurich a very complete exhibit illustrating anthrax and the work of the Government wool-disinfecting station at Liverpool under the charge of Mr. G. E. Duckering. Among the pathological specimens were the recent additions to the pathological museum at Leeds on which Prof. M. J. Stewart gave a demonstration.

THE EXHIBITION.

An exhibition of surgical instruments, appliances, drugs, food, &c., was held in the Windsor Halls from July 22nd to 25th. It was opened by Mr. Basil Hall in the presence of a large company, when he observed that he had opened many things in his time, some with corkscrews and some with other instruments, but he was for the first time opening an exhibition of that kind. He had no doubt of its great educational value in the suggestion of new ideas and in the inspiration of better technique. His remarks were endorsed by the Lord Mayor. A description of the exhibits will appear later.

EXCURSIONS AND SOCIAL AMENITIES.

During the stay of the Association in Bradford there were no fewer than 18 excursions, including a whole-day trip to the Lake District, the duties of transport officer being undertaken by Dr. Benjamin Wade, who secured the loan of 100 or more private cars. The staff work was so good that in no case was a party more than ten minutes late in starting. Visits were paid to Harrogate, York, and Scarborough, to the corporation water-works, and to many surrounding places of historic interest. An opportunity was afforded to those who wished it to see the various processes of local manufacture on a large scale. The official and private receptions were all largely attended. The Bradford Rotary Club gave a luncheon which led to useful interchange of opinion on some of the social problems of the moment.

At the official service at the Cathedral on Tuesday afternoon, July 22nd, the Archbishop of York spoke of the ministry of healing, and suggested that the time had come for full and impartial inquiry into the relation of body, mind, and spirit in the cure of disease. The B.M.A. Council, meeting the next day, decided that the difficulties with which this matter is at present surrounded would be likely to lead the investigation outside the sphere of the recognised activities of the Association, and after deliberation decided not to proceed with the reappointment of the committee on spiritual healing.

WELFARE OF THE BLIND.—A deputation from the National Union of the Professional and Industrial Blind was received by the Minister of Health on July 28th. The deputation, through Mr. Ben Purse, the general secretary, advanced reasons for objecting to the provisions contained in the Blind Persons Act Amending Bill now before Parliament. Mr. Purse pleaded for the further development of the present system of coöperation between the State, the local authorities, and the voluntary organisations. Mr. Wheatley was more particularly asked to take all possible steps for the prevention of blindness both in infancy and in adult life, and a number of administrative improvements were urged upon his attention. In reply, Mr. Wheatley said he was to see other deputations with regard to the blind in the course of the week, but he felt no difficulty in promising the most sympathetic consideration of all the points raised.

INDIRECT METHODS OF ADVERTISING.

REPORT OF CENTRAL ETHICAL COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

THE subject of "oblique advertising," discussed at the representative meeting of the British Medical Association on Tuesday, July 22nd, came up on a very carefully prepared report of the Central Ethical Committee. During the past few years there have been brought to the attention of this Committee certain journalistic developments which seem likely, if unchecked, seriously to undermine some of the most cherished traditions associated with medical practice in this country, and to lower the reputation of the profession among the more thoughtful sections of the community. In May, 1905, in consequence of representations made by the Association, the General Medical Council issued the following notice:—

The G.M.C. and Open Advertisements.

The practice of (*a*) advertising by a registered medical practitioner with a view to his own gain, particularly if depreciatory of other practitioners, or of sanctioning such advertising, of (*b*) employing or sanctioning the employment of agents or canvassers for the purpose of procuring patients, and of (*c*) associating with or accepting employment under any Association which practises canvassing or advertising for the purpose of procuring patients, are in the opinion of the Council contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner resorting to any of such practices renders himself liable on proof of the facts to have his name erased from the Medical Register.

The result has undoubtedly been a great decrease in the cruder and more open forms of advertisement. The issue of handbills announcing the qualifications of medical practitioners and the door-to-door canvass for members of medical clubs are now only occasional occurrences. Of recent years, however, a subtle and indirect method of giving publicity to certain medical practitioners has obtained currency in the text and illustrations of the lay press, sometimes without and sometimes apparently with the active concurrence of those referred to. This publicity, by reason of the form that it takes and the medium that it adopts, results in a very effective advertisement for the person concerned. Such means of personal advancement may be considered legitimate in other walks of life but have in the past been shunned as undignified by the medical profession.

Scope of Warning Extended.

In February, 1922, the Association again addressed a communication to the G.M.C. asking if the time had not arrived when some authoritative pronouncement on the subject should be made. The G.M.C. replied (i.) that if a new offence not within the present Warning Notices was becoming prevalent, a flagrant case might be selected to be brought before the Council which would give it careful attention: and (ii.) that it was not the custom of the Council to issue a Warning Notice until the hearing of a case had established the need for it. At the December, 1922, Session of the G.M.C., however, one of the direct representatives of the profession on the General Medical Council raised the question afresh. As a result, it was remitted to the Executive Committee of the Council in consultation with the legal advisers, to consider and report upon the expediency of amending the Council's Warning Notice with respect to canvassing and advertising so as to make its scope more clear and comprehensive. At the June, 1923, Session of the G.M.C., the following new paragraph 6 of the Warning Notice was adopted:

Advertising and Canvassing.

The practices by a registered medical practitioner:—

(*a*) Of advertising, whether directly or indirectly, for the purpose of obtaining patients or promoting his own professional advantage; or, for any such purpose, or procuring or sanctioning or acquiescing in the publication of notices commending or directing attention to the practitioner's professional skill, knowledge, services, or qualifications, or depreciating those of others; or of being associated with or employed by those who procure or sanction such advertising or publication, and

(*b*) Of canvassing or employing any agent or canvasser for the purpose of obtaining patients; or of sanctioning or of being associated with or employed by those who sanction, such employment;

are in the opinion of the Council contrary to the public interest and discreditable to the profession of medicine, and any registered medical practitioner who resorts to any such practice renders himself liable on proof of the facts to have his name erased from the Medical Register.

The Newer Methods of Advertising.

Examples of the newer methods are to be found in interviews granted to newspaper representatives, and in signed letters or articles sent to newspapers. In many of these, members of the profession, either by the direct assertion of the journalists concerned, or by more indirect methods, are referred to as possessing, or allow it to be inferred from their own words that they possess, methods of treatment superior to those practised by others. In the opinion of the Committee the word "advertising" in connexion with the medical profession must be taken in its broadest sense, to include all those ways by which a person is made publicly known, either by himself, or by others without his objection, in a manner which can fairly be regarded as "for the purpose of obtaining patients or promoting his own professional advantage."

Accepted Customs.

It is generally accepted by the profession that certain customs are so universally practised that it cannot be said that they are for the person's own advantage, as, for instance, a door-plate with the simple announcement of the doctor's name and profession. Even this, however, may be abused by undue particularity or elaboration.

Intra-Professional Channels.—It is commonly agreed that channels must be open for discussion between members of the profession for recording the results of research and clinical experience and for bringing to the notice of other members books published and facilities for treatment offered. The recognised channels are medical societies, medical periodicals, and works primarily intended for the medical profession. The information so given is intended for the convenience and advantage of the profession, which will be in a position to judge of the value of the information and of the manner in which it is conveyed. Even this legitimate kind of advertisement is capable of abuse.

The Medical Man as Citizen.—It is the recognised duty and right of a medical man to take his share as a citizen in public life, but there is no reason why this should involve any advertisement of himself as a doctor, and, with due care, improper advertisement can be avoided.

Publicity as an Official Duty.—Publicity is rightly allowed to medical men not in actual practice of their profession since they cannot be regarded as using this publicity for the purpose of promoting their own professional advantage, and in view of the official position of medical officers of health and other medical men who hold posts in either the public health or other public service, publicity is sometimes not only permissible but necessary for the fulfilment of their official duty. The presumption in all these cases is that publicity is not sought for the individual's own gain though it is possible that the practice might be abused and the presumption therefore fail.

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Speaking generally, it may be said that the medical men most often quoted in the press are not those whose opinions carry most weight with the medical profession or with the educated public. It is natural that those whom the press representatives most eagerly seek to draw into their service and utilise for their own advantage are those who have some recognised position or well-sounding address or title. It is, therefore, especially important that a stand should be made by such practitioners, who perhaps do not realise that the example set by them may well be pleaded in justification by those in a less prominent position.

Attitude of the Association.

After making all allowances for all those modes of publicity for which there may be some justification, there remain many instances which can only be regarded as gravely and unnecessarily contravening the spirit of the notice of the G.M.C. The Association is convinced that in taking up an attitude of determined opposition to these undesirable journalistic methods the Association is acting in the best interests of the public as well as of the medical profession. The extension of the system can only lead to a competition for public notice in which the abler and more scrupulous men would be left behind by those who professionally are greatly inferior, to the detriment of the public, who are ill-qualified to judge of the true worth of scientific opinions. The extension of the advertising habit among the profession in general would certainly destroy those traditions of dignity and self-respect which have helped to give the British medical profession its present high status, and would gravely undermine the amenities and harmonious working of medical practice.

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Correspondence.

"Audi alteram partem."

ANTHELMINTICS AND THEIR NOMENCLATURE.

To the Editor of The Lancet.

Sir,—In connexion with the leading article on anthelmintics in your issue of July 19th, I should like to point out that current nomenclature is in certain respects misleading and likely to cause confusion between santonin and chenopodium. Santonin is derived from santonica, the dried flower-heads of the composite *Artemisia maritima var. stachmanniana.* Artemisia assumes a great diversity of forms which were the object of attentive study on the part of the Russian botanist, Besser, in 1834–35, and his researches have resulted in the union of many supposed species under the name *Artemisia maritima.* A specimen of the plant labelled in his handwriting, with a memorandum that it was collected for medicinal use, is in the herbarium at Kew. It completely agrees with the Russian wormseed or *Flores cinæ* of commerce, cinæ being the name given to wormseed in homœopathic literature. It was first given by Wilkomm in 1872, when he described as mother plant of wormseed the Artemisia which he found in Turkestan. This Russian santonica is often known as Levant wormseed or merely as wormseed (Wurmsamen in the German Pharmacopœia), although it is not strictly a seed at all. For therapeutic use the pure definite chemical compound, santonin, is preferable to "wormseed" or santonica, as samples of wormseed are often met with which contain practically no santonin at all. Indeed, it is generally only the plant grown in Russian Turkestan which contains satisfactory amounts of santonin; attempts to grow a santonin-yielding plant in other localities have so far been unsuccessful. In veterinary practice wormseed is often preferred, and in that case care should be taken that only a genuine Russian wormseed of good quality is used.

The so-called American wormseed from which oil of chenopodium is derived is obtained from a totally different plant, belonging to a different family—namely, *Chenopodium ambrosioides anthelminticum*, and has thus nothing in common with the santonin-yielding "wormseed." The oil derived from the fruit of this plant owes its anthelmintic properties, as stated in your article, to entirely different substances from santonin, "ascaridole" being the chief. The synonym "wormseed oil" sometimes used for it is therefore unfortunate, and it should always be referred to as chenopodium oil. This confusion is particularly noticeable in German publications. In a recent paper in the *Deutsche Medizinische Wochenschrift*, describing five cases of poisoning from the oil (four of them fatal), it is indiscriminately referred to as Wurmsamenöl and Ol. Chenopodii.

I am, Sir, yours faithfully,

Percy May, D.Sc. Lond., F.I.C.

The Laboratory, Staple Inn Buildings, Holborn, W.C.,
July 25th, 1924.

THE FACULTY OF MEDICINE IN THE UNIVERSITY OF LONDON.

To the Editor of The Lancet.

Sir,—The letter in your issue of July 19th, signed by Profs. Parsons, Frazer, and Barclay-Smith, is a valuable and much needed protest against decisions on important medical questions being taken by the Senate of the University of London, without consultation of the Boards of Studies in Medicine or of the Faculty itself. The signatories to the letter prefer (I think rightly) that the whole Faculty should be consulted in such cases.

A curiously pertinent instance of a tendency to ignore the existence of the Faculty occurred at the last meeting of the Senate (on July 23rd). In my capacity as chairman of the Council for External Students I brought forward a resolution, passed unanimously by my Council, recommending that a proposition to institute a new degree in the Faculty of Medicine should be referred to that Faculty before the Senate in fact instituted the new degree. This resolution was opposed at the Senate by the Dean of the Faculty of Medicine, who enunciated the astonishing doctrine that it was useless to consult that Faculty because its membership was too large. Disfranchisement seems an odd reward for vigorous expansion! Chiefly as a result of this unexpected opposition by the titular head of the Faculty my motion was defeated, and a new degree, Bachelor of Pharmacy, in the Faculty of Medicine will accordingly be established without the wishes of the Faculty or any of its Boards of Studies being ascertained. I think it behoves the Faculty to assert its rights and to insist upon its views being heard in matters of grave medical importance, notwithstanding the strange reluctance of its Dean to consult the body to which he owes his seat upon the Senate.

I am, Sir, yours faithfully,

E. Graham Little,
Representative on the Senate of the Medical and Surgical Graduates of Convocation.

July 26th, 1924.

THE USE OF CEREALS IN PRESERVATION OF THE TEETH.

To the Editor of The Lancet.

Sir,—In your issue of July 19th you draw attention in an editorial article to certain experiments on the cereal feeding of dogs: similar experiments are recorded in the second edition of the Report on the Present State of Knowledge of Accessory Food Factors (Vitamins) published by the Medical Research Council (Special Report Series, No. 38, revised).

The Bread and Food Reform League has for many years directed attention to the value of whole cereals as a means of securing good teeth, and is therefore concerned lest any misinterpretation of the results of these experiments should bring this valuable prophylactic into disrepute. In the report quoted above it is stated (p. 96) that it was found by E. Mellanby, while investigating the experimental production of rickets in puppies, "that of the cereals examined, oatmeal, as bought in the shops, was the most potently rickets-producing, and that the disease developed much more seriously and rapidly on oatmeal than on whole wheaten meal, white wheaten flour, or rice. The difference between the action of wholemeal and white flour and rice was not so great, but wholemeal flour was slightly worse than white flour and rice." Again (p. 150): "Cereals differed in their detrimental action on teeth-formation—oatmeal was the worst of those examined; white flour and rice the best." It is further stated (p. 96) that "The explanation of these unexpected results obtained with different cereals has not yet been suggested."

Now the following facts about whole cereals, to which the Bread and Food Reform League has for many years directed attention, may help to solve this problem. It is agreed that, in order to form good bones and teeth, it is necessary not only that food should contain phosphorus, lime, and the growth-promoting and antirachitic vitamins, but also that the adequacy of calcification is influenced by the amount and *balance* of these substances in the diet. As far back as 1880 it was recognised that whole cereals contained a large proportion of phosphorus and a limited amount of lime. Therefore, as the late Sir Arthur Church, F.R.S., stated, wholemeal bread should be supplemented as a diet by a plentiful supply of green vegetables. The amount of calcium in 5 per cent. of whole-milk does not, according to McCollum, furnish enough calcium to balance diets consisting of cereals, legume seeds, tubers, fleshy roots, and meat (Johns Hopkins Hospital Bulletin, 1922).

I suggest, therefore, that puppies fed on oatmeal and milk did not obtain sufficient calcium to balance the large amount of phosphorus found in oats, and that it is for this reason that they had defective teeth. Mellanby's experiments showed that the addition of cod-liver oil to the diet of these puppies "completely transformed the structure of the teeth." However, the wide variations in metabolism as evidenced by the difference in susceptibility of different animals to the diseases produced by diet, "suggest caution in applying results indiscriminately from one animal to another" (report quoted above, p. 84). In guinea-pigs, for example, deficiency of the *antiscorbutic* vitamin resulted in defective teeth (Zilva and Wells), while McCollum and his co-workers (1922) incriminated the absence of this vitamin as a factor in producing oral disease.

It is not contended by anyone that wholemeal bread taken alone forms perfectly balanced food, but that in conjunction with green vegetables and fats containing vitamins C and A it forms a better balanced dietary than does white bread. It would be most unfortunate if, as the result of a few experiments on puppies, the impression should be spread that cereals have a detrimental effect on tooth and bone formation, especially since whole nations, for example, the inhabitants of the Northern Provinces of India, who live principally on wheatmeal, are known to have excellent teeth.

I am, Sir, yours faithfully,

MAY YATES,

Hon. Sec. Bread and Food Reform League.

37, Essex-street, London, W.C. 2.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.

We are, Sir, yours faithfully,

J. & A. CHURCHILL.

7, Great Marlborough-street, London, W.1,
July 29th, 1924.

TRAINING OF NURSES.

To the Editor of THE LANCET.

SIR,—It will be remembered that at the recent British Hospitals Association meetings in London I raised the question as to the regulations of the General Nursing Council with regard to the recognition of smaller hospitals in the training of nurses. Since then I have been in correspondence with Sir Wilmot Herringham and the General Nursing Council, and to-day I have received a letter of which a copy is appended.

The General Nursing Council,
12, York Gate, Regent's Park,
London, N.W. 1.
28th July, 1924.

DEAR SIR,—The Council on July 25th resolved that the following be added to the scheme for the training of nurses who will be admitted to the Register after the training and examination rules come into operation:—

"I. (3) There are other hospitals which are sufficiently large, but from deficiency of clinical material in some branch cannot be approved as complete training schools. Such hospitals will be required to associate themselves with another hospital or hospitals in order to supply for their nurses that part of the training in which they are deficient. The Council is prepared to consider any scheme for carrying out such an arrangement, but the period of training must extend over three years and six months and it will be for the hospitals who propose to associate themselves to satisfy the Council that the arrangements will be adequate to afford a complete training. Such hospitals will be entitled 'Associated Hospitals.'"

Your hospital will fall under this rule. We have no reason to anticipate that the Minister of Health will disapprove the rule.

Yours faithfully,

MARIAN C. RUNDLE,

Registrar.

As this question is of immediate and the utmost importance to the smaller hospitals of our country, I shall be glad if you will insert this letter in your next issue. I also desire to take this opportunity personally to thank the representatives of nearly 30 hospitals who were good enough to express their kind appreciation of my efforts.

I am, Sir, yours faithfully,

Grimsby, July 29th, 1924. JOHN BARKER.

SQUINT, LEFT-HANDEDNESS AND STAMMER.

To the Editor of THE LANCET.

SIR,—My son, when about 5 years old, showed himself left-handed at games, and as this peculiarity has been a difficulty of mine, I determined to save him in his turn from the defect. With this in view I spent some hours bowling to him on the condition that he should use his bat right-handed. I was successful, he was cured of the habit. A few years after this he developed a marked hesitation of speech, and I have been informed that this affection is a not infrequent result of the correction of a left-handed habit. For want of a term I coined one. I had produced "inverted cerebration." The college authorities of a large school here advised me to put him under Mr. Schnelle, of Bedford Mansions, and I am grateful to him for the result. The boy is almost entirely cured. Mr. Schnelle in answer to my questions says he has known similar cases. What I should like to ask in your columns is this: What is the position as regards other functions? Does the "inverted cerebration" confine its pernicious effects to the speech centre? I should be grateful for any help on the point. I am, Sir, yours faithfully,

July 28th, 1924. F.R.C.S. Irel.

⁂ Dr. W. S. Inman sends us this week an interesting article in which this subject is dealt with.—ED. L.

Parliamentary Intelligence.

HOUSE OF LORDS.

Workmen's Compensation (Silicosis) Bill.

ON Thursday, July 24th, the Workmen's Compensation (Silicosis) Bill was read a second time. On Tuesday, July 29th, the Bill was read a third time and passed.

HOUSE OF COMMONS.

TUESDAY, JULY 22ND.

Educational Health Services.

The House went into Committee of Supply on a vote of £25,900,000 for the salaries and expenses of the Board of Education, Mr. ROBERT YOUNG, Chairman of Committees, in the chair.

Mr. TREVELYAN (President of the Board of Education) said many schools which were in process of condemnation before the war were still in existence and had remained untouched and unimproved. Many of those schools were ill-lighted, overcrowded, and even insanitary, and many of them had barely any playground and some none at all. He was at this moment having a complete survey made by his inspectors, and in the course of the autumn he would make clear what school buildings could be allowed only a limited period for their continued existence. Some of them would have to be condemned outright and the reconstruction of others would be required. He did not intend to set up too high a standard for the poor sorts of school, for if he wanted satisfactory school buildings everywhere he would have to condemn schools in droves in every county. What he was going to do was to get rid of the worst schools.

Replying to subsequent discussion, Mr. MORGAN JONES (Parliamentry Secretary of the Board of Education) said no reasonable proposal for the erection of new school clinics or for the extension of the buildings where treatment was provided had been rejected by the Board. The number of new special schools certified since April 1st, 1923, was 13, and since Jan. 1st four of these 13 had been approved.

The vote was agreed to.

Correspondence.

"Audi alteram partem."

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The so-called American wormseed from which oil of chenopodium is derived is obtained from a totally different plant, belonging to a different family—namely, *Chenopodium ambrosioides anthelminticum,* and has thus nothing in common with the santonin-yielding "wormseed." The oil derived from the fruit of this plant owes its anthelmintic properties, as stated in your article, to entirely different substances from santonin, "ascaridole" being the chief. The synonym "wormseed oil" sometimes used for it is therefore unfortunate, and it should always be referred to as chenopodium oil. This confusion is particularly noticeable in German publications. In a recent paper in the *Deutsche Medizinische Wochenschrift,* describing five cases of poisoning from the oil (four of them fatal), it is indiscriminately referred to as Wurmsamenöl and Ol. Chenopodii.

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PERCY MAY, D.Sc. Lond., F.I.C.

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To the Editor of THE LANCET.

SIR,—The letter in your issue of July 19th, signed by Profs. Parsons, Frazer, and Barclay-Smith, is a valuable and much needed protest against decisions on important medical questions being taken by the Senate of the University of London, without consultation of the Boards of Studies in Medicine or of the Faculty itself. The signatories to the letter prefer (I think rightly) that the whole Faculty should be consulted in such cases.

A curiously pertinent instance of a tendency to ignore the existence of the Faculty occurred at the last meeting of the Senate (on July 23rd). In my capacity as chairman of the Council for External Students I brought forward a resolution, passed unanimously by my Council, recommending that a proposition to institute a new degree in the Faculty of Medicine should be referred to that Faculty before the Senate in fact instituted the new degree. This resolution was opposed at the Senate by the Dean of the Faculty of Medicine, who enunciated the astonishing doctrine that it was useless to consult that Faculty because its membership was too large. Disfranchisement seems an odd reward for vigorous expansion! Chiefly as a result of this unexpected opposition by the titular head of the Faculty my motion was defeated, and a new degree, Bachelor of Pharmacy, in the Faculty of Medicine will accordingly be established without the wishes of the Faculty or any of its Boards of Studies being ascertained. I think it behoves the Faculty to assert its rights and to insist upon its views being heard in matters of grave medical importance, notwithstanding the strange reluctance of its Dean to consult the body to which he owes his seat upon the Senate.

I am, Sir, yours faithfully,

E. GRAHAM LITTLE,

Representative on the Senate of the Medical and Surgical Graduates of Convocation.

July 26th, 1924.

THE USE OF CEREALS IN PRESERVATION OF THE TEETH.

To the Editor of THE LANCET.

SIR,—In your issue of July 19th you draw attention in an editorial article to certain experiments on the cereal feeding of dogs: similar experiments are recorded in the second edition of the Report on the Present State of Knowledge of Accessory Food Factors (Vitamins) published by the Medical Research Council (Special Report Series, No. 38, revised).

The Bread and Food Reform League has for many years directed attention to the value of whole cereals as a means of securing good teeth, and is therefore concerned lest any misinterpretation of the results of these experiments should bring this valuable prophylactic into disrepute. In the report quoted above it is stated (p. 96) that it was found by E. Mellanby, while investigating the experimental production of rickets in puppies, "that of the cereals examined, oatmeal, as bought in the shops, was the most potently rickets-producing, and that the disease developed much more seriously and rapidly on oatmeal than on whole wheaten meal, white wheaten flour, or rice. The difference between the action of wholemeal and white flour and rice was not so great, but wholemeal flour was slightly worse than white flour and rice." Again (p. 150): "Cereals differed in their detrimental action on teeth-formation—oatmeal was the worst of those examined; white flour and rice the best." It is further stated (p. 96) that "The explanation of these unexpected results obtained with different cereals has not yet been suggested."

Now the following facts about whole cereals, to which the Bread and Food Reform League has for many years directed attention, may help to solve this problem. It is agreed that, in order to form good bones and teeth, it is necessary not only that food should contain phosphorus, lime, and the growth-promoting and antirachitic vitamins, but also that the adequacy of calcification is influenced by the amount and *balance* of these substances in the diet. As far back as 1880 it was recognised that whole cereals contained a large proportion of phosphorus and a limited amount of lime. Therefore, as the late Sir Arthur Church, F.R.S., stated, wholemeal bread should be supplemented as a diet by a plentiful supply of green vegetables. The amount of calcium in 5 per cent. of whole-milk does not, according to McCollum, furnish enough calcium to balance diets consisting of cereals, legume seeds, tubers, fleshy roots, and meat (Johns Hopkins Hospital Bulletin, 1922).

I suggest, therefore, that puppies fed on oatmeal and milk did not obtain sufficient calcium to balance the large amount of phosphorus found in oats, and that it is for this reason that they had defective teeth. Mellanby's experiments showed that the addition of cod-liver oil to the diet of these puppies "completely transformed the structure of the teeth." However, the wide variations in metabolism as evidenced by the difference in susceptibility of different animals to the diseases produced by diet, "suggest caution in applying results indiscriminately from one animal to another" (report quoted above, p. 84). In guinea-pigs, for example, deficiency of the *antiscorbutic* vitamin resulted in defective teeth (Zilva and Wells), while McCollum and his co-workers (1922) incriminated the absence of this vitamin as a factor in producing oral disease.

It is not contended by anyone that wholemeal bread taken alone forms perfectly balanced food, but that in conjunction with green vegetables and fats containing vitamins C and A it forms a better balanced dietary than does white bread. It would be most unfortunate if, as the result of a few experiments on puppies, the impression should be spread that cereals have a detrimental effect on tooth and bone formation, especially since whole nations, for example, the inhabitants of the Northern Provinces of India, who live principally on wheatmeal, are known to have excellent teeth.

I am, Sir, yours faithfully,

MAY YATES,

Hon. Sec. Bread and Food Reform League.

37, Essex-street, London, W.C. 2.

THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—The annual circular has been posted to each member of the medical profession. If the form has not been received, a duplicate will be sent on request. We shall be grateful for the return of the forms by an early post.

We are, Sir, yours faithfully,

J. & A. CHURCHILL.

7, Great Marlborough-street, London, W.1,
July 29th, 1924.

TRAINING OF NURSES.

To the Editor of THE LANCET.

SIR,—It will be remembered that at the recent British Hospitals Association meetings in London I raised the question as to the regulations of the General Nursing Council with regard to the recognition of smaller hospitals in the training of nurses. Since then I have been in correspondence with Sir Wilmot Herringham and the General Nursing Council, and to-day I have received a letter of which a copy is appended.

The General Nursing Council,
12, York Gate, Regent's Park,
London, N.W. 1.
28th July, 1924.

DEAR SIR,—The Council on July 25th resolved that the following be added to the scheme for the training of nurses who will be admitted to the Register after the training and examination rules come into operation:—

"I. (3) There are other hospitals which are sufficiently large, but from deficiency of clinical material in some branch cannot be approved as complete training schools. Such hospitals will be required to associate themselves with another hospital or hospitals in order to supply for their nurses that part of the training in which they are deficient. The Council is prepared to consider any scheme for carrying out such an arrangement, but the period of training must extend over three years and six months and it will be for the hospitals who propose to associate themselves to satisfy the Council that the arrangements will be adequate to afford a complete training. Such hospitals will be entitled 'Associated Hospitals.'"

Your hospital will fall under this rule. We have no reason to anticipate that the Minister of Health will disapprove the rule.

Yours faithfully,

MARIAN C. RUNDLE,

Registrar.

As this question is of immediate and the utmost importance to the smaller hospitals of our country, I shall be glad if you will insert this letter in your next issue. I also desire to take this opportunity personally to thank the representatives of nearly 30 hospitals who were good enough to express their kind appreciation of my efforts.

I am, Sir, yours faithfully,

Grimsby, July 29th, 1924. JOHN BARKER.

SQUINT, LEFT-HANDEDNESS AND STAMMER.

To the Editor of THE LANCET.

SIR,—My son, when about 5 years old, showed himself left-handed at games, and as this peculiarity has been a difficulty of mine, I determined to save him in his turn from the defect. With this in view I spent some hours bowling to him on the condition that he should use his bat right-handed. I was successful, he was cured of the habit. A few years after this he developed a marked hesitation of speech, and I have been informed that this affection is a not infrequent result of the correction of a left-handed habit. For want of a term I coined one. I had produced "inverted cerebration." The college authorities of a large school here advised me to put him under Mr. Schnelle, of Bedford Mansions, and I am grateful to him for the result. The boy is almost entirely cured. Mr. Schnelle in answer to my questions says he has known similar cases. What I should like to ask in your columns is this: What is the position as regards other functions? Does the "inverted cerebration" confine its pernicious effects to the speech centre? I should be grateful for any help on the point.

I am, Sir, yours faithfully,

July 28th, 1924. F.R.C.S. Irel.

*** Dr. W. S. Inman sends us this week an interesting article in which this subject is dealt with.—ED. L.

Parliamentary Intelligence.

HOUSE OF LORDS.

Workmen's Compensation (Silicosis) Bill.

ON Thursday, July 24th, the Workmen's Compensation (Silicosis) Bill was read a second time. On Tuesday, July 29th, the Bill was read a third time and passed.

HOUSE OF COMMONS.

TUESDAY, JULY 22ND.

Educational Health Services.

The House went into Committee of Supply on a vote of £25,900,000 for the salaries and expenses of the Board of Education, Mr. ROBERT YOUNG, Chairman of Committees, in the chair.

Mr. TREVELYAN (President of the Board of Education) said many schools which were in process of condemnation before the war were still in existence and had remained untouched and unimproved. Many of those schools were ill-lighted, overcrowded, and even insanitary, and many of them had barely any playground and some none at all. He was at this moment having a complete survey made by his inspectors, and in the course of the autumn he would make clear what school buildings could be allowed only a limited period for their continued existence. Some of them would have to be condemned outright and the reconstruction of others would be required. He did not intend to set up too high a standard for the poor sorts of school, for if he wanted satisfactory school buildings everywhere he would have to condemn schools in droves in every county. What he was going to do was to get rid of the worst schools.

Replying to subsequent discussion, Mr. MORGAN JONES (Parliamentry Secretary of the Board of Education) said no reasonable proposal for the erection of new school clinics or for the extension of the buildings where treatment was provided had been rejected by the Board. The number of new special schools certified since April 1st, 1923, was 13, and since Jan. 1st four of these 13 had been approved.

The vote was agreed to.

Public-Health (Scotland) Amendment Bill.

On the motion for the third reading of the Public Health (Scotland) Amendment Bill,

Mr. Buchanan said he regretted that the Bill had been amended in Committee and that the Secretary for Scotland was going to be prevented in the future if science found some new method of dealing with disease from being able to carry that remedy to the poor people at the earliest possible moment. If the question of expense was going to be raised at all it should not be raised on a Bill of this sort. While accepting this Bill he expressed the hope that the Secretary for Scotland would in a short time go into the whole question of coördinating the health services and would help the local authorities in more generous fashion.

Sir J. Gilmour said it was only right that Parliament should know of any fresh departure which was made in these grave medical matters and that they should also know through the Minister concerned why orders were proposed. Parliament should know to what the local authorities were being committed. If any fresh discovery was made in regard to the cure of such a fell disease as cancer the House of Commons, however it might be composed, would give its consent to any measure provided that it was satisfied that it was a correct one and was approved by the medical profession.

The Bill was read a third time.

Wednesday, July 23rd.

Deaths in Urban and Rural Areas.

Mr. Black asked the Minister of Health whether he could account for the large variations given in the figures supplied by him on July 1st in the deaths in urban areas—viz., fluctuations from 7·2 to 16·5 per 1000, and in rural areas fluctuations from 7·0 to 19·7 per 1000; whether the higher rates applied to areas where sanitary conditions were the worst and the public medical and maternity services were least efficient; and whether he proposed any measures to bring down the high incidence of mortality in certain areas to that of the lower.—Mr. Wheatley replied: I am advised that the considerable variations in the death-rate for 1923 as between area and area cannot be assigned to specific causes, and, moreover, that it is hazardous to attempt to draw inferences from the mortality-rates for a single year. It is, however, the fact that, in the case of both the urban and the rural area with the highest rates for 1923, the sanitary conditions are not satisfactory, and my department is giving attention to these conditions.

Lymph used at Hendon Institute.

Mr. Black asked the Minister of Health whether he would investigate the records which have been kept showing the pedigree of the lymph used at the Hendon institute; what was the nature and origin of the strains of lymph now in circulation by the Government; and whether he could supply a chart showing the pedigree of a single strain of lymph now in use.—Mr. Wheatley replied: The records show that the lymph now used at the Government Lymph Establishment is derived from calf lymph originally obtained from Cologne and the strain has since been carried on, as the hon. Member was informed on April 2nd last, by repeated transference from animal to animal. I fear it is impracticable to chart the pedigree as suggested in a form which would be readily understood.

National Health Insurance.

Mr. William M. Adamson asked the Minister of Health if the National Health Insurance (Prolongation of Insurance) Act would be renewed for 1925.—Mr. Wheatley replied: Provision has been included in the expiring Laws Continuance Bill now before Parliament for the extension until Dec. 31st, 1925, of the operation of the National Health Insurance (Prolongation of Insurance) Act.

Maternal Mortality in Kensington.

Mr. James Gardner asked the Minister of Health whether he was aware that the rate per annum of maternal mortality per 1000 births was for 1919–21, Kensington 4·31, Poplar 2·90, and West Ham 2·03, and Kensington, in 1921, 3·9, in 1922, 5·0, and in 1923, 5·8; whether he was aware that this high maternal mortality in Kensington almost wholly occurred among the poorer classes; whether he would give the figures of maternal mortality in Poplar and West Ham for 1923; and whether his medical staff would investigate and inquire whether necessitous mothers and expectant mothers in Kensington received sufficient assistance in midwifery and suitable food either from the guardians or the borough council.—Mr. Wheatley replied: The rates given in the first part of the question are the maternal mortality-rates for the period 1919–22, not 1919–21. For Kensington, the rate was 4·10 in 1921, 4·76 in 1922, and 4·81 in 1923; for Poplar and West Ham, the rates in 1923 were 3·29 and 3·08 respectively. I am well aware of the high maternal mortality in Kensington, which no doubt occurs mainly among the poorer classes, and the borough council have recently taken steps to improve and extend the midwifery facilities in the borough. The council have, for some time past, made arrangements for the supply of meals and milk to expectant and nursing mothers in necessitous cases.

Geneva Committee on Anthrax.

Mr. Somerville Hastings asked the Minister of Health what conclusion had been reached by the Committee on Anthrax at the recent International Labour Conference at Geneva, in view of the substantial number of cases of anthrax which continued to occur and the admitted fact that the work of the disinfecting station at Liverpool could not be wholly efficient until supplemented by international action.—Mr. Davies (Under-Secretary to the Home Office) replied: I am not quite sure that I understand my hon. friend's meaning. The recent international conference rejected the proposal of the British Government that the question of an international convention in regard to the disinfection of infected varieties of wool should be placed on the agenda of next year's conference, notwithstanding that the proposal was based on the report of the International Anthrax Committee which recommended such disinfection. The policy of the British Government is not, however, dependent on the conclusion of an international convention on the subject. Parliament has already by the Anthrax Prevention Act, 1919, authorised the necessary measures for securing such disinfection in the case of infected material imported into this country, and it is the intention of the Government to proceed with the measures that were initiated by their predecessors for this purpose.

Houses Built under the Addison Scheme.

Mr. Mardy Jones asked the Minister of Health what was the total number of dwelling-houses built under the Addison scheme during each year from 1919 to 1923, inclusive.—Mr. Wheatley replied: The numbers of houses completed in each year from 1919 to 1923 under schemes authorised by the Housing Acts of 1919 were as follows:—

Year.	Local authorities' and public utility societies' schemes.	Private builders' subsidy schemes.	Total.
1919	100	—	100
1920	9,171	6,540	15,711
1921	68,255	18,414	86,660
1922	74,769	14,232	89,001
1923	15,679	—	15,679
Total ..	167,974	39,186	207,160

Out-relief in England.

Mr. Graham White asked the Minister of Health the number of persons in receipt of out-relief in England as on Jan. 1st and July 1st, 1924.—Mr. Wheatley replied: On the nearest dates to those named for which figures are available the numbers were 961,297 and 846,458.

Thursday, July 24th.

Ministry of Pensions Hospitals.

Mr. Darbishare asked the Minister of Pensions the number of hospitals now under the administration of the Ministry; the number of beds occupied and vacant; and the total annual expenditure incurred in maintaining these hospitals, including medical staff, &c.—Mr. F. O. Roberts replied: The present number of military hospitals is 33, the number of occupied beds 6249, and of vacant beds 1188. This latter figure is temporarily in excess of the normal number of vacant beds which must be kept for the change of patients. This is due to the fact that certain hospitals, no longer required, are being vacated but are still partially occupied pending evacuation. The expenditure by the Ministry in maintaining these hospitals is estimated at £755,000 for the present financial year.

Tuberculosis in the Scottish Highlands.

Mr. MacKenzie Livingstone asked the Secretary for Scotland in view of the present high death-rate from tuberculosis due to the deplorable housing conditions in various crofting areas in the Highlands of Scotland, when he proposed to take steps to improve the housing conditions in the Highlands.—Mr. Adamson replied: I am aware that the death-rate from tuberculosis in various crofting areas is high, though I cannot admit that bad housing is the sole contributory cause. Considerable improvements have recently taken place in the housing conditions in many districts of the Highlands and Islands. Facilities for improving the housing conditions in the Highlands and Islands are already available under the existing law and will be extended to some extent under the provisions of the Housing Bill. Under that Bill the whole area within the Highlands and Islands (exclusive of burghs) will be a rural area within which the higher rate of subsidy will be payable in cases to which it is applicable. Under existing arrangements crofters are entitled to assistance on special terms from the Board of Agriculture for the improvement and provision of houses and in addition they may obtain a subsidy from the local authority in terms of Section 2 of the Housing Act of 1923. Under Clause 7 of the present Bill if a local authority fails to take steps to make the subsidy under the Act of 1923 available to crofters the Board may pay it direct. So far as the second part of the question is concerned every step which it is possible for me to take to accelerate improvement in the housing conditions will be taken.

Single Room Tenements in England and Wales.

Mr. ALDEN asked the Minister of Health what were the last available figures as to the number of single-room tenements in England and Wales.—Mr. GREENWOOD replied: According to the 1921 census, which furnishes the most recent figures available on the subject, there were 317,417 private families in England and Wales occupying one room or less apiece, the aggregate number of rooms occupied by them being 317,260.

New Child Welfare Centres.

Mr. ALDEN asked the Minister of Health the number of new child welfare centres at December, 1923, and at the present time.—Mr. GREENWOOD replied: According to the information in the possession of my department the number of maternity and child welfare centres in England and Wales was 2201 on Dec. 1st, 1923, and 2,272 on July 1st, 1924.

MONDAY, JULY 28TH.

Composition of Patent Medicines.

Sir KINGSLEY WOOD asked the Minister of Health whether his attention had been called to the dangers arising from the unrestricted sales of certain patent medicines; that their manufacturers were not compelled to disclose the composition of the product bearing their labels or prevented from advertising it as a cure for a particular ailment; and whether he proposed to take any action in the matter to further protect the public.—Mr. GREENWOOD replied: My right hon. friend's attention has been called to this matter, but he fears that in the present state of business the Government cannot undertake to introduce legislation on this subject during the present session.

Maternity Benefits in India.

Mr. SCURR asked the Under Secretary of State for India whether it was the intention of the Government of India to ratify the proposals of the International Labour Convention of Washington concerning maternity benefits.—Mr. RICHARDS replied: The answer is in the negative. The Washington Conference of 1919 resolved that the Indian Government should be requested to make a study of the question of the employment of women before and after confinement, and of maternity benefits, and to report on these matters.

Child Mortality in Bombay.

Mr. SCURR asked the Under Secretary of State for India the mortality-rate for children under one year and under five years for each of the years 1919, 1920, 1921, 1922, and 1923 in Bombay.—Mr. RICHARDS replied: The following are the figures for 1919 and 1920:—

Ratio of Deaths per 1000 of Population in Bombay Presidency According to Age.

Year.	Under 1 year.		1 year and under 5 years.	
	Males.	Females.	Males.	Females.
1919	206·70	196·73	56·48	55·32
1920	191·42	174·26	45·60	43·20

The figures for 1921, 1922, and 1923 are not yet available.

TUESDAY, JULY 29TH.

Assaults on Young Girls.

Sir THOMAS BRAMSDON asked the Home Secretary if he was now in a position to give the names of the members of the departmental committee who will inquire into the subject of assault on young girls, the terms of reference, and any other information relating to the matter.—Mr. DAVIES (Under Secretary to the Home Office) replied: My right hon. friend has now appointed a committee under the chairmanship of Sir Ryland Adkins, K.C., with the following terms of reference: "To collect information and to take evidence as to the prevalence of sexual offences against young persons, and to report upon the subject, indicating any direction in which, in their opinion, the law or its administration might be improved." The other members are Mr. H. W. Disney, Miss E. H. Kelly, J.P., Miss Clara Martineau, J.P., Dr. A. H. Norris, Mr. R. J. Parr, Mrs. Rackham, J.P., and Sir Guy Stephenson. The secretary is Miss J. I. Wall, of the Home Office.

Medical News.

UNIVERSITY OF OXFORD.—The following degrees in medicine have been conferred at recent Congregations:—

D.M.—N. F. Smith, Balliol; H. H. Sanguinetti, Wadham; J. F. Venables, Magdalen; and G. K. Stone, Trinity.

B.M.—R. E. D. Cargill, Christ Church; W. J. E. Lupton, New; K. J. Franklin, Oriel; G. R. P. Aldred-Brown, Keble; H. W. Pearson, Brasenose; C. J. Fuller, Queen's; A. A. F. Peel, University; G. P. Wright, Exeter; C. W. Carter, and G. I. Wilson, Queen's; W. H. Bradley, Christ Church; D. R. Gawler, University; C. A. H. Green, Trinity; A. D. Dyson, Corpus Christi; and E. H. Koerner, Magdalen.

UNIVERSITY OF LONDON.—Dr. A. W. M. Ellis, who has been appointed as from Oct. 1st, 1924, to the University chair of medicine tenable at the London Hospital Medical College, was educated at Upper Canada College and at the University of Toronto. In 1908–09 he served as house physician and house surgeon in the Hospital for Sick Children, Toronto, and during 1909–10 he was resident pathologist at the Lakeside Hospital, Cleveland, Ohio, and demonstrator in pathology in the Western Reserve University Medical School. In 1910–11 he assisted in the teaching of pathological chemistry at the University of Toronto. From 1911 to 1914 he was assistant physician to the hospital of the Rockefeller Institute. During the war he was in charge of the Cerebro-spinal Fever Hospital at Bulford (1914–15), from where he proceeded to France with the 1st Canadian Division, becoming officer commanding the Canadian Mobile Laboratory in 1916. In 1918 he was appointed adviser in pathology to the Fourth Army. In 1919 he received a grant from the Medical Research Council and since 1920 he has been assistant director of the medical unit at the London Hospital.

At a recent meeting of the Senate, the Vice-Chancellor (Prof. E. A. Gardner) being in the chair, the Bethlem Royal Hospital was admitted as a school of the University in the Faculty of Medicine for the purpose of research in psychological medicine. The resignation by Prof. H. R. Kenwood, of the Chadwick Chair of Hygiene at University College, as from December next, was accepted with regret, and with an expression of appreciation of his long and valued services to the College and to the University. Sir Wilmot P. Herringham has been elected chairman of the committee of the medical members of the Senate for 1924–25.

At examinations held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—John A. Birrell, Univ. Coll Cardiff and St. George's Hosp.; Florence R. Dingley, Univ. Coll. Hosp.; Arthur H. Douthwaite, Guy's Hosp.; John N. Kerr, (University Medal), St. Bart.'s Hosp.; Reginald C. Lightwood, King's Coll. Hosp.; and Gladys M. Wauchope, St. Andrews University and London Hosp.

Branch IV., Midwifery and Diseases of Women.—Janet K. Aitken and Edith K. Budden, London Sch. of Med. for Women; Calvert M. Gwillim, St. Bart.'s Hosp.; Dorothy McNair, London Sch. of Med. for Women; and Kathleen H. Matthews, London Sch. of Med. for Women and St. Mary's Hosp.

Branch V., State Medicine.—Harry Shannon, St. Bart.'s Hosp. and Univ. Coll.

M.S. EXAMINATION.

Branch I., Surgery.—Grant Massie, Guy's Hosp.; and Arthur D. Wright, St. Mary's Hosp.

Branch IV., Laryngology, Otology, and Rhinology.—Victor E. Negus (University Medal), King's Coll. Hosp.

UNIVERSITY OF WALES.—At a recent congregation held at University College of North Wales, Bangor, the following degrees were conferred:—

M.B., B.Ch.—David I. Bowen, Daniel T. Davies, Edith M. Davies, Leslie C. Edwards, Martha Griffith, Emrys D. Owen, and Constance Walters.

M.Sc. (hon. causa).—Dr. Harry Drinkwater.

LL.D. (hon. causa).—Sir Donald MacAlister.

UNIVERSITY OF EDINBURGH.—At the graduation ceremonial on July 25th the following degrees were conferred:—

DOCTOR OF MEDICINE.

Alexander G. Biggam, Arnold Davies, *George D. Fairley, *Thomas Ferguson, ‡Shankar W. Hardikar, †John F. C. Haslam, †Thomas D. Inch, †John Jeffrey, *Frans Krone, *Abdurrahman Khan Lauddie (in absentia), ‡Robert C. Low, *Harry S. Lucraft, Douglas I. O. Macaulay, Edward S. Massiah (in absentia), Charles I. Milne, Janet M. Murray, John O. Murray, Owen T. Owen, *Graham C. Ramsay (in absentia), James W. G. H. Riddel, Stephen Rowland, Arnold H. Shennan, *Basil H. H. Spence, *Adam White, *Stephen H. Wilkinson, ‡George S. Williamson, and Edward A. Wilson.

* Commended for thesis. † Highly commended for thesis.
‡ Awarded gold medal for thesis.

Bachelor of Medicine and Bachelor of Surgery.

*Alexander M. Affleck, James A. Aitchison, James Aitken, Agnes M. Allan, Arthur J. W. Allen, Arthur A. Allison, *James M. Alston, James M. Anderson, Rupert G. Anderson, William L. Anderson, Frank R. Ashton, Douglas Bell, Richard Bell, Roland A. Bennett, William D. Bertram, Charles M. Bethune, William J. Bethune, Wilhelmus H. Biccard, Charles A. Bingham, Robert A. F. Blair, *Thomson Bonar, Marion Bow, Tom R. Bowden, Eric P. Boyle, Cuthbert A. Bozman, Abraham Brodie, Marjorie I. Brotherston, Kenneth R. Brown, Margaret C. Bruce, Joyce L. Bunting, Cyril P. Burges, Margaret C. Burnett White, Robertha Burt, Rennie C. Burton, Fernie L. Buttar, Bertha M. Butters, Donald Cameron, Ian M'D. Cameron, Angus F. Campbell, George M. Campbell, Robert J. W. Charlton, William N. Chisholm, Elizabeth K. Clark, Margaret R. Clark, John Cottrell, William D. Couper, James Crawford, Elsie V. Crowe, Donald A. Cunningham, Frank Danks, William R. Davies, Cyril Davies-Jones, Leslie J. Davis, Edgar Dockray, Mary K. D. Douglas, John E. Dovey, Anne Duguid, Ian Duguid, *John Durran, Richard O. Eaton, Daniel M. Edington, Reginald A. Edmondson, Archibald . Fairbairn, Alan A. Fothergill, Arnold Foxcroft, Abel J. Gans, Cecil E. G. Gill, Keith H. Gillison, Edward J. G. Glass, Isaac Goldberg, George R. Gomez, Ernest W. Goodwin, Edmund G. R. Grant, James L. Harley, Jacob W. Harris, Thomas B. Harvey, Donald J. D. Henderson, Percy S. Henderson, Dorothy P. Herdman, Richard Hermon, John Heron, Charles E. V. Horne, John L. Horne, Thomas Howden, Elenora J. Howie, John W. Hunter, Norman M. Hunter, Charles Hurwitz, Lewis I. Johnston, Jeannie Kean, Thomas P. Keating, Winifred K. N. Kemp, George R. Kennedy, Paul A. H. King, David Laing, Ferdinand W. Lang, John H. D. Lawrie, William J. Liddle, Jacob S. Liptz, Phyllis E. List, Ralph Lodge, Elizabeth B. Lorne, Kathleen B. Lorraine, Gwyneth D. Love, John Lowe, Ian E. M'Cracken, Andrew S. M'Culloch, Mellis MacCulloch, Alan A. S. M'Donald, Donald R. Macdonald, Ian J. Macdonald, James F. M'Donald, Ronald A. Macdonald, Henry M. MacGill, *Isabel M. MacGillivray, Donald M'Gregor, Ian G. MacGregor, William Mackay, Helen W. MacKenzie, Henry W. D. Mackenzie, William J. Mackintosh, Angus E. W. M'Lachlan, † Donald G. S. M'Lachlan, Helen S. M'Laren, Donald Macleod, John Macleod, *John T. M'Ouat, Shena Macvicar, William R. Main, Margaret F. B. Marshall, Alexander N. Melvin, Andrew I. Messer, †Ruth E. Millar, William G. Millar, Robert D. Miller, Kathleen G. Milner, †Grace E. Monro, John G. B. F. Morris, James R. Murdoch, Charles A. Murray, George B. Murray, Henry A. Murray, Bernard Myer, Harry Myers, Izak Z. G. Nel, Barbara K. Nicholson, George S. Nicoll, Sam Noll, John G. Oliver, Winifred Ormerod, John R. Paterson, Harry Patrick, †William G. Patterson, John H. Penman, Thomas V. R. Philip, Herbert B. Porteous, Annie Rabinowitz, Frances A. Redhead, Herbert R. M. Richards, James A. Richardson, Archibald H. D. O. Richmond, Robert G. Riddell, George Robb, Rhoda B. V. Robb, Arwyn Roberts, Lewis G. Rosa, Fraser M. Rose, Andrew M'K. Ross, Anita H. M. Ross, William M. Ross, Cecil F. Rostant, Charles M. Russell, Iain Sanderson, Robert C. Scott, Max Segal, Archibald J. Shedden, Thomas D. Shiels, Herbert Shirlaw, Mark F. de Silva, Agnes M. C. Simpson, *Winifred M. Small, Ernest Smalley, Cecil H. Snowdowne, John R. Somerville, John W. Starkey, John P. Steel, Noel M. Stephen, Robert S. Stewart, Stephen S. L. Steyn, Robert I. Stirling, Arthur J. Stout, Donald N. Stuart, Haydn R. Stubbins, Annie Sutherland, Jessie C. B. Sym, Jack Symon, John M. R. Thomas, Thomas H. Thomson, Albert T. Till, †Margaret C. Tod, Agnes F. Turner, *James F. G. Turner, William S. Urquhart, Jessy W. Ward, John Williamson, William C. Wilson, Walter Wyatt, Frederick E. Wynne, Helen M. A. Young, John A. B. Young, and Roberta M'G. Young.

* Second-class honours. † First-class honours.

The following diplomas were awarded :—

Diploma in Tropical Medicine and Hygiene.

Reginald J. Matthews (in absentia).

Diploma in Public Health.

Elizabeth A. Baxendine (in absentia), Elizabeth S. Blair, Jane P. S. Bow, William Boyd, Harry H. Condie, Mary I. S. Cuthbert (in absentia), Edward C. Ellis (in absentia), Jean F. Farquhar, Edith N. Hartley (in absentia), Doris M. Hopps, Janet M. Morton, Agnes M. Ogilvie, Leopold T. Poole, Robert J. Reid, William A. Simpson, Archibald G. H. Smart, Dorothy F. Smith, Vera Thompson, Edgar P. Waters, John H. H. Williams, and Charles R. Wilson.

The Cameron Prize in Practical Therapeutics was awarded to Dr. Harvey Cushing, Moseley Professor of Surgery, Harvard University, and Surgeon-in-Chief, Peter Bent Brigham Hospital, Boston, Mass., for important contributions to the Surgery of the Brain.

Royal College of Surgeons of Edinburgh.—At a meeting of the College held on July 25th Sir Harold J. Stiles, President, in the chair, the 22 successful candidates out of 57 entered, who passed the requisite examinations between March 31st and April 7th were admitted Fellows :—

Robert G. G. Croly, Ronald Cuttle, Hugh Donovan, Samuel E. Duff, Arthur A. Gommell, Peter F. Gow, Pooran C. Kacker, Hilda M. Lazarus, Laura M. Ligertwood, John D. McLaggan, Ebenezer R. Maduram, Sukumar Nag, Ellen L. A. Pateman, Richard H. C. Pryn, Cecil A. Rae, Zelman Schwartz, Louis Sive, Rufus C. Thomas, Allan P. Walden, Hugh A. B. Whitelocke, William R. Williams, and Thomas G. W[illegible]

The following candidates have passed the Final Dental Professional Examination and have been granted the diploma of L.D.S. R.C.S. Edin. :—

William J. Irvine, Schalk W. van der Merwe, Andrew M. Rabie, Annan B. Ness, Hector H. Tomlinson, Alexander R. Gibb, James Baird, Frederick H. Boltman, Clarence G. Morgans, William G. S. Inglis, Susan S. Grandison, Daniel Bell, James Lumsden, William D. McKenzie, George P. Main, and Francis W. Kynoch.

East Suffolk and Ipswich Hospital.—On July 28th the war memorial wing of the hospital at Ipswich was opened by the Duke of Connaught. The new building has been erected at a cost of £67,000, and has increased the permanent accommodation of the hospital from 113 to 270 patients.

University of Manchester.—The Court of the University, on the unanimous recommendation of the Council and Senate, has invited Prof. S. J. Hickson, F.R.S., to continue his tenure of the Beyer Chair of Zoology for a further period of two years from September next. Miss Hilda Linford, M.B., Ch.B. Manch., has been appointed demonstrator in human physiology, and Mr. E. Nevill Willmer, B.A., demonstrator in experimental physiology. The Platt Physiological Scholarship has been awarded to Mr. G. L. Brown.

London (R.F.H.) School of Medicine for Women.—In October will be celebrated the jubilee of this school. The festivities already planned include a public dinner at the Guildhall on Oct. 24th and a festival service at St. Paul's Cathedral on Oct. 25th. It is hoped to raise the sum of £50,000 to endow three chairs of pathology, physiology, and anatomy respectively, to be named after the three pioneer women in medicine, Dr. Elizabeth Blackwell, Dr. Elizabeth Garrett Anderson, and Miss Sophia Jex-Blake. The Queen has headed the list of donations for this purpose with £50, and already eight gifts of £1000 each have been received—four of them from women doctors, and other sums amounting to £1387 have been promised. Donations to the endowment fund should be made payable to the hon. treasurer, Sir Alan G. Anderson, and addressed to the organising secretary, Mrs. K. Balfour Duffus, at 8, Hunter-street, London, W.C. 1.

British Pharmaceutical Conference.—At the sixty-first conference, which was held recently at Bath, under the chairmanship of Mr. Edmund White, the question of whether legislation should be introduced to control the manufacture and sale of patent medicines formed the principal subject of discussion. Mr. Philip F. Rowsell, of Exeter, vice-president of the Pharmaceutical Society of Great Britain, said that it was a matter of urgent public necessity to remedy the more flagrant evils and abuses existing in the sale of patent medicines, for except in so far as patent medicines came within the scope of the Poisons and Pharmacy Act, the trade was subject to no important restrictions at all. And the trade was increasing: in 1914 the receipts from the medicine stamp duty were £360,000, while in 1923 they were nearly £1,250,000. Two possible means of control were suggested: (1) that the manufacturers state the composition of the product on the label, or (2) that there should be some machinery for the control of advertising. One delegate said that professionally the control of the trade would be an advantage, although from the business point of view it would inevitably be detrimental to the pharmacist. Sir William Glyn-Jones, secretary of the Pharmaceutical Society, said that it was the duty of the Pharmaceutical Society to assist the authorities in suppressing abuses of the trade. He added that many more or less patent drugs sold ought to be on the poison schedule. Mr. Sheppard, a delegate from Exeter, urged that the declaration of alcoholic content should be compulsory. The sale of pseudo-medicated wines, he declared, led to a great deal of secret drinking. Finally the subject was referred to the Council of the Pharmaceutical Society for the formation of a scheme and its submission to the branches.

Donations and Bequests.—The late Mr. Bernard Frederick Laporte, of Harpenden, Herts, left by will £250 to Treloar's Cripples' Home; £250 to the Bute Hospital, Luton; and £150 to the Children's Sick and Convalescent Home, London-road, Luton.—Under the will of the late Miss Elizabeth Catherine Theresa Hickes, of Brook-street, Bath, the testatrix left £500 to the Royal Mineral Water Hospital, Bath, and £300 to the Royal United Hospital, Bath; £50 to the Eastern Dispensary, Bath; £50 to the Western Dispensary, Bath; £100 to the Bath District Nurs[illegible]itution; £100 to the Convalescent Home at Cor[illegible] £100 to the Home for Cripples, Prospect-pla[illegible] to the M[illegible]l Mission Fund of the Society for t[illegible]l.—By will the late Mrs. Janet [illegible]ad, Hampstead, N.W., and Leamington. left among other bequests £5000 to St. Columba's Hospital, Avenue-road, N.W.; £5000 to the Hospital for Consumption and Diseases of the Chest, Fulham-road, S.W.: £500 to the London Hospital; £300 to the Faversham Cottage Hospital; and £300 to the Royal Victoria and West Hants Hospital at Boscombe and Bournemouth.—The late Mr. J. C. White, formerly Lord Mayor of Belfast. bequeathed the sum of £100,000, to be devoted to charitable purpose at the discretion of his executors, Messrs. Skinner, McMillan, and Wheeler. The above sum has now been allocated. The Royal Victoria Hospital receives £6000, the Bangor Hospital £5000, and various Belfast Hospitals £1000 each. Several Dublin hospitals and county infirmaries in Northern Ireland also receive the sum of £1000.—The sum of £500 has been presented to the King Edward's Hospital Fund by H.I.H. Tafari Makonnen of Abyssinia.—The British Empire Cancer Campaign has received a further sum of £600 as a result of the special collections organised by the Northamptonshire branch of the British Red Cross Society. The Birmingham branch has remitted an additional £162 from the collections in that city.

Bermondsey Municipal Convalescent Home.—The Minister of Health, Mr. Wheatley, formally opened this home for mothers and babies at Fawkham, Kent, on July 26th. The house—Fairley Grange—has nearly 20 acres of grounds and is the gift of Dr. A. Salter, formerly M.P. for Bermondsey.

The late Dr. W. J. Kerr.—William James Kerr, M.D. Manch., J.P., died at his residence in Rochdale on July 24th at the age of 58. Dr. Kerr received his early education at the Manchester Grammar School and his medical training at Owens College, the Manchester University, and the Royal Infirmary of Manchester, graduating as M.B. and Ch.B. in Victoria University in 1890. He became M.R.C.S. and L.R.C.P. Lond. in the same year. In 1895 he took the degree of M.D. in his University with high commendation. Dr. Kerr began practice in Rochdale in 1896 and speedily built up a large practice, from which he retired a few years ago. Appointed in 1896 an honorary surgeon of the Royal Infirmary, he took an active part in its medical and administrative work, and was president of the medical board during 1911 and 1912, and later a consulting surgeon. He was for 16 years surgeon to the police force of Rochdale. During the war he placed his services at the disposal of the Parliamentary Recruiting Committee, acted as an examiner of recruits, and undertook the duties of factory inspector for Rochdale. His chief interests apart from matters political—for he was an ardent politician—were in public health and sanitary matters, and besides holding medical offices, Dr. Kerr was a member of the town council for ten years, a magistrate, and a J.P. of the borough.

Death of Dr. Edmund M. Smith.—The death of Dr. Edmund Smith occurred on July 23rd, following soon upon his retirement as health officer for the city of York, when occasion was taken to chronicle his work in the public service (The Lancet, June 14th). Edmund Moody Smith was a native of Leeds, received his medical education at Edinburgh University where he graduated M.B., C.M. in 1888 and M.D. in 1891, being awarded the Milner-Fothergill medal. He was a successful general practitioner in York until he became deputy medical officer of health in 1898 and whole-time officer two years later. His appointment as school medical officer followed in 1908, and the special (open-air) schools for mentally defective and physically defective children at Fulford Field remain as monuments of his interest in this direction. Dr. Smith was an active member of the York Musical Society and of the Yorkshire Philosophical Society. He was just 60 years of age and leaves a widow.

THE LANCET: SUBSCRIPTION RATES.

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INDEX TO "THE LANCET," Vol. I., 1924.

The Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of The Lancet, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Appointments.

Cohen, Henry, M.D. Liverp., has been appointed Assistant Honorary Physician at the Royal Infirmary, Liverpool.

Cosens, W. B., M.R.C.S., L.R.C.P. Lond., an Hon. Consulting Surgeon to the Dorset Mental Hospital.

Jenkins, Winifred M., M.B., B.S. Lond., Medical Missionary to the Holy Cross Hospital, Kaffraria, S. Africa, by the S.P.G.

Kettle, Edgar Hartley, M.D., B.S., of St. Mary's Hospital, Professor of Pathology and Bacteriology in the Welsh National School of Medicine.

Vacancies.

For further information refer to the advertisement columns.

Belfast Joint Nursing and Midwives Council for Northern Ireland.—Examiners.

Birkenhead Education Committee.—Asst. M.O. £600.

Birmingham, Woodlands Open Air Hospital.—H.S. £250.

Cambridge, Addenbrooke's Hospital.—H.S. £130.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. £125. Also Radiologist.

Durham, Holywood Hall Sanatorium, Wolsingham.—Locum Asst. Res. M.O. £40 per month.

Freemasons Hospital and Nursing Home.—Res. M.O. £250.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—H.S. £175.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Melbourne University, Victoria, Australia.—Chair of Pathology. £1200.

Norwich City.—Temp. Asst. School M.O. £11 11s. weekly.

Pontypridd Union, Llwynypia Hospital.—Supt. M.O. £700.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.

Sherwood Forest, Notts, Ransom Sanatorium.—Asst. R.M.O. £375.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.

Staffordshire Education Committee.—Asst. Sch. Med. Insp. £600.

West Ham County Borough.—M.O.H. and Chief Sch. M.O. £1500.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Worksop (Nottingham).

Births, Marriages, and Deaths.

BIRTHS.

Harvey.—On July 21st, at Lane End, Bournville, Birmingham, the wife of W. F. Harvey, M.A., M.B., of a daughter.

Martin.—On July 25th, the wife of James Purdon Martin, M.D., Hunter House, Hunter-street, W.C., of a son.

Paterson.—On July 28th, at 17, Manchester-street, to Dorothy, wife of Dr. Donald Paterson, of 13, Upper Wimpole-street—a son.

MARRIAGES.

Crockford—Brookes-Smith.—On July 21st, at St. John's Church, Holmwood, Allen Lepard Crockford, M.C., M.B., B.Ch., to Doris Ellen Brookes-Smith, younger daughter of Mr. J. H. Brookes-Smith and Mrs. Brookes-Smith, of Brook Meadow, The Holmwood, near Dorking.

Ormsby—Duggan.—On July 25th, at the Chapel Royal, London, after civil ceremony, William Ormsby, late Captain, R.A.M.C., of Rathmoy, Ballina, Co. Mayo, South Ireland, to Mary A. Duggan (*née* Brunt), of Long Sutton, Lincs., near Wisbech.

DEATHS.

Benthall.—On July 25th, at Priory-road, N.W., suddenly, Albert Benthall, F.R.C.P.E., aged 74.

Engelbach.—On June 24th, at Cape Town, Harold Augustus Engelbach, M.B., B.Ch.T.C.D., Medical Officer of S.A. Police and District Surgeon of Cape Town, aged 52 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Bachelor of Medicine and Bachelor of Surgery.

*Alexander M. Affleck, James A. Aitchison, James Aitken, Agnes M. Allan, Arthur J. W. Allen, Arthur A. Allison, *James M. Alston, James M. Anderson, Rupert G. Anderson, William L. Anderson, Frank R. Ashton, Douglas Bell, Richard Bell, Roland A. Bennett, William D. Bertram, Charles M. Bethune, William J. Bethune, Wilhelmus H. Biccard, Charles A. Bingham, Robert A. F. Blair, *Thomson Bonar, Marion Bow, Tom R. Bowden, Eric P. Boyle, Cuthbert A. Bozman, Abraham Brodie, Marjorie I. Brotherston, Kenneth R. Brown, Margaret C. Bruce, Joyce L. Bunting, Cyril P. Burges, Margaret C. Burnett, White, Robertha Burt, Rennie C. Burton, Fernie L. Buttar, Bertha M. Butters, Donald Cameron, Ian M'D. Cameron, Angus F. Campbell, George M. Campbell, Robert J. W. Charlton, William N. Chisholm, Elizabeth K. Clark, Margaret R. Clark, John Cottrell, William D. Couper, James Crawford, Elsie V. Crowe, Donald A. Cunningham, Frank Danks, William R. Davies, Cyril Davies-Jones, Leslie J. Davis, Edgar Dockray, Mary K. D. Douglas, John E. Dovey, Anne Duguid, Ian Duguid, *John Durran, Richard O. Eaton, Daniel M. Edington, Reginald A. Edmondson, Archibald . Fairbairn, Alan A. Fothergill, Arnold Foxcroft, Abel J. Gans, Cecil E. G. Gill, Keith H. Gillison, Edward J. G. Glass, Isaac Goldberg, George R. Gomez, Ernest W. Goodwin, Edmund G. R. Grant, James L. Harley, Jacob W. Harris, Thomas B. Harvey, Donald J. D. Henderson, Percy S. Henderson, Dorothy P. Herdman, Richard Hermon, John Heron, Charles E. V. Horne, John L. Horne, Thomas Howden, Elenora J. Howie, John W. Hunter, Norman M. Hunter, Charles Hurwitz, Lewis I. Johnston, Jeannie Kean, Thomas P. Keating, Winifred K. N. Kemp, George R. Kennedy, Paul A. H. King, David Laing, Ferdinand W. Lang, John H. D. Lawrie, William J. Liddle, Jacob S. Liptz, Phyllis E. List, Ralph Lodge, Elizabeth B. Lorne, Kathleen B. Lorraine, Gwyneth D. Love, John Lowe, Ian E. M'Cracken, Andrew S. M'Culloch, Mellis MacCulloch, Alan A. S. M'Donald, Donald R. Macdonald, Ian J. Macdonald, James F. M'Donald, Ronald A. Macdonald, Henry M. MacGill, *Isabel M. MacGillivray, Donald M'Gregor, Ian G. MacGregor, William Mackay, Helen W. MacKenzie, Henry W. D. Mackenzie, William J. Mackintosh, Angus E. W. M'Lachlan, † Donald G. S. M'Lachlan, Helen S. M'Laren, Donald Macleod, John Macleod, *John T. M'Ouat, Shena Macvicar, William R. Main, Margaret F. B. Marshall, Alexander N. Melvin, Andrew I. Messer, †Ruth E. Millar, William G. Millar, Robert D. Miller, Kathleen G. Milner, †Grace E. Monro, John G. B. F. Morris, James R. Murdoch, Charles A. Murray, George B. Murray, Henry A. Murray, Bernard Myer, Harry Myers, Izak Z. G. Nel, Barbara K. Nicholson, George S. Nicoll, Sam Noll, John G. Oliver, Winifred Ormerod, John R. Paterson, Harry Patrick, †William G. Patterson, John H. Penman, Thomas V. R. Philip, Herbert B. Porteous, Annie Rabinowitz, Frances A. Redhead, Herbert R. M. Richards, James A. Richardson, Archibald H. D. O. Richmond, Robert G. Riddell, George Robb, Rhoda B. V. Robb, Arwyn Roberts, Lewis G. Rosa, Fraser M. Rose, Andrew M'K. Ross, Anita H. M. Ross, William M. Ross, Cecil F. Rostant, Charles M. Russell, Iain Sanderson, Robert C. Scott, Max Segal, Archibald J. Shedden, Thomas D. Shiels, Herbert Shirlaw, Mark F. de Silva, Agnes M. C. Simpson, *Winifred M. Small, Ernest Smalley, Cecil H. Snowdowne, John R. Somerville, John W. Starkey, John P. Steel, Noel M. Stephen, Robert S. Stewart, Stephen S. L. Steyn, Robert I. Stirling, Arthur J. Stout, Donald N. Stuart, Haydn R. Stubbins, Annie Sutherland, Jessie C. B. Sym, Jack Symon, John M. R. Thomas, Thomas H. Thomson, Albert T. Till, †Margaret C. Tod, Agnes F. Turner, *James F. G. Turner, William S. Urquhart, Jessy W. Ward, John Williamson, William C. Wilson, Walter Wyatt, Frederick E. Wynne, Helen M. A. Young, John A. B. Young, and Roberta M'G. Young.

* *Second-class honours.* † *First-class honours.*

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Reginald J. Matthews (in absentia).

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London (R.F.H.) School of Medicine for Women.—In October will be celebrated the jubilee of this school. The festivities already planned include a public dinner at the Guildhall on Oct. 24th and a festival service at St. Paul's Cathedral on Oct. 25th. It is hoped to raise the sum of £50,000 to endow three chairs of pathology, physiology, and anatomy respectively, to be named after the three pioneer women in medicine, Dr. Elizabeth Blackwell, Dr. Elizabeth Garrett Anderson, and Miss Sophia Jex-Blake. The Queen has headed the list of donations for this purpose with £50, and already eight gifts of £1000 each have been received—four of them from women doctors, and other sums amounting to £1387 have been promised. Donations to the endowment fund should be made payable to the hon. treasurer, Sir Alan G. Anderson, and addressed to the organising secretary, Mrs. K. Balfour Duffus, at 8, Hunter-street, London, W.C. 1.

British Pharmaceutical Conference.—At the sixty-first conference, which was held recently at Bath, under the chairmanship of Mr. Edmund White, the question of whether legislation should be introduced to control the manufacture and sale of patent medicines formed the principal subject of discussion. Mr. Philip F. Rowsell, of Exeter, vice-president of the Pharmaceutical Society of Great Britain, said that it was a matter of urgent public necessity to remedy the more flagrant evils and abuses existing in the sale of patent medicines, for except in so far as patent medicines came within the scope of the Poisons and Pharmacy Act, the trade was subject to no important restrictions at all. And the trade was increasing; in 1914 the receipts from the medicine stamp duty were £360,000, while in 1923 they were nearly £1,250,000. Two possible means of control were suggested: (1) that the manufacturers state the composition of the product on the label, or (2) that there should be some machinery for the control of advertising. One delegate said that professionally the control of the trade would be an advantage, although from the business point of view it would inevitably be detrimental to the pharmacist. Sir William Glyn-Jones, secretary of the Pharmaceutical Society, said that it was the duty of the Pharmaceutical Society to assist the authorities in suppressing abuses of the trade. He added that many more or less patent drugs sold ought to be on the poison schedule. Mr. Sheppard, a delegate from Exeter, urged that the declaration of alcoholic content should be compulsory. The sale of pseudo-medicated wines, he declared, led to a great deal of secret drinking. Finally the subject was referred to the Council of the Pharmaceutical Society for the formation of a scheme and its submission to the branches.

Donations and Bequests.—The late Mr. Bernard Frederick Laporte, of Harpenden, Herts, left by will £250 to Treloar's Cripples' Home: £250 to the Bute Hospital, Luton; and £150 to the Children's Sick and Convalescent Home, London-road, Luton.—Under the will of the late Miss Elizabeth Catherine Theresa Hickes, of Brook-street, Bath, the testatrix left £500 to the Royal Mineral Water Hospital, Bath, and £300 to the Royal United Hospital, Bath: £50 to the Eastern Dispensary, Bath; £50 to the Western Dispensary, Bath: £100 to the Bath District Nursing Institution; £100 to the Convalescent Home at Combe Down: £100 to the Home for Cripples, Prospect-place, Bath; £100 to the Medical Mission Fund of the Society for the Propagation of the Gospel.—By will the late Mrs. Janet Grace Heritage, of Elsworthy-road, Hampstead, N.W., and Leamington, left among other bequests £5000 to St. Columba's Hospital, Avenue-road, N.W.; £5000 to the Hospital for Consumption and Diseases of the Chest, Fulham-road, S.W.; £500 to the London Hospital; £300 to the Faversham Cottage Hospital; and £300 to the Royal Victoria and West Hants Hospital at Boscombe and Bournemouth.—The late Mr. J. C. White, formerly Lord Mayor of Belfast, bequeathed the sum of £100,000, to be devoted to charitable purpose at the discretion of his executors, Messrs. Skinner, McMillan, and Wheeler. The above sum has now been allocated. The Royal Victoria Hospital receives £6000, the Bangor Hospital £5000, and various Belfast Hospitals £1000 each. Several Dublin hospitals and county infirmaries in Northern Ireland also receive the sum of £1000.—The sum of £500 has been presented to the King Edward's Hospital Fund by H.I.H. Tafari Makonnen of Abyssinia.—The British Empire Cancer Campaign has received a further sum of £600 as a result of the special collections organised by the Northamptonshire branch of the British Red Cross Society. The Birmingham branch has remitted an additional £162 from the collections in that city.

BERMONDSEY MUNICIPAL CONVALESCENT HOME.—The Minister of Health, Mr. Wheatley, formally opened this home for mothers and babies at Fawkham, Kent, on July 26th. The house—Fairley Grange—has nearly 20 acres of grounds and is the gift of Dr. A. Salter, formerly M.P. for Bermondsey.

THE LATE DR. W. J. KERR.—William James Kerr, M.D. Manch., J.P., died at his residence in Rochdale on July 24th at the age of 58. Dr. Kerr received his early education at the Manchester Grammar School and his medical training at Owens College, the Manchester University, and the Royal Infirmary of Manchester, graduating as M.B. and Ch.B. in Victoria University in 1890. He became M.R.C.S. and L.R.C.P. Lond. in the same year. In 1895 he took the degree of M.D. in his University with high commendation. Dr. Kerr began practice in Rochdale in 1896 and speedily built up a large practice, from which he retired a few years ago. Appointed in 1896 an honorary surgeon of the Royal Infirmary, he took an active part in its medical and administrative work, and was president of the medical board during 1911 and 1912, and later a consulting surgeon. He was for 16 years surgeon to the police force of Rochdale. During the war he placed his services at the disposal of the Parliamentary Recruiting Committee, acted as an examiner of recruits, and undertook the duties of factory inspector for Rochdale. His chief interests apart from matters political—for he was an ardent politician—were in public health and sanitary matters, and besides holding medical offices, Dr. Kerr was a member of the town council for ten years, a magistrate, and a J.P. of the borough.

DEATH OF DR. EDMUND M. SMITH.—The death of Dr. Edmund Smith occurred on July 23rd, following soon upon his retirement as health officer for the city of York, when occasion was taken to chronicle his work in the public service (THE LANCET, June 14th). Edmund Moody Smith was a native of Leeds, received his medical education at Edinburgh University where he graduated M.B., C.M. in 1888 and M.D. in 1891, being awarded the Milner-Fothergill medal. He was a successful general practitioner in York until he became deputy medical officer of health in 1898 and whole-time officer two years later. His appointment as school medical officer followed in 1908, and the special (open-air) schools for mentally defective and physically defective children at Fulford Field remain as monuments of his interest in this direction. Dr. Smith was an active member of the York Musical Society and of the Yorkshire Philosophical Society. He was just 60 years of age and leaves a widow.

THE LANCET: SUBSCRIPTION RATES.

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INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Appointments.

COHEN, HENRY, M.D. Liverp., has been appointed Assistant Honorary Physician at the Royal Infirmary, Liverpool.

COSENS, W. B., M.R.C.S., L.R.C.P. Lond., an Hon. Consulting Surgeon to the Dorset Mental Hospital.

JENKINS, WINIFRED M., M.B., B.S. Lond., Medical Missionary to the Holy Cross Hospital, Kaffraria, S. Africa, by the S.P.G.

KETTLE, EDGAR HARTLEY, M.D., B.S., of St. Mary's Hospital, Professor of Pathology and Bacteriology in the Welsh National School of Medicine.

Vacancies.

For further information refer to the advertisement columns.

Belfast Joint Nursing and Midwives Council for Northern Ireland.—Examiners.

Birkenhead Education Committee.—Asst. M.O. £600.

Birmingham, Woodlands Open Air Hospital.—H.S. £250.

Cambridge, Addenbrooke's Hospital.—H.S. £130.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. £125. Also Radiologist.

Durham, Holywood Hall Sanatorium, Wolsingham.—Locum Asst. Res. M.O. £40 per month.

Freemasons Hospital and Nursing Home.—Res. M.O. £250.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—H.S. £175.

Jersey General Hospital and Poor-law Infirmary.—Res. M.O. £200.

Leeds Public Dispensary.—Sen. Res. M.O. £200.

Melbourne University, Victoria, Australia.—Chair of Pathology. £1200.

Norwich City.—Temp. Asst. School M.O. £11 11s. weekly.

Pontypridd Union, Llwynypia Hospital.—Supt. M.O. £700.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.

Sherwood Forest, Notts, Ransom Sanatorium.—Asst. R.M.O. £375.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.

Staffordshire Education Committee.—Asst. Sch. Med. Insp. £600.

West Ham County Borough.—M.O.H. and Chief Sch. M.O. £1500.

THE Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Worksop (Nottingham).

Births, Marriages, and Deaths.

BIRTHS.

HARVEY.—On July 21st, at Lane End, Bournville, Birmingham, the wife of W. F. Harvey, M.A., M.B., of a daughter.

MARTIN.—On July 25th, the wife of James Purdon Martin, M.D., Hunter House, Hunter-street, W.C., of a son.

PATERSON.—On July 28th, at 17, Manchester-street, to Dorothy, wife of Dr. Donald Paterson, of 13, Upper Wimpole-street—a son.

MARRIAGES.

CROCKFORD—BROOKES-SMITH.—On July 21st, at St. John's Church, Holmwood, Allen Lepard Crockford, M.C., M.B., B.Ch., to Doris Ellen Brookes-Smith, younger daughter of Mr. J. H. Brookes-Smith and Mrs. Brookes-Smith, of Brook Meadow, The Holmwood, near Dorking.

ORMSBY—DUGGAN.—On July 25th, at the Chapel Royal, London, after civil ceremony, William Ormsby, late Captain, R.A.M.C., of Rathmoy, Ballina, Co. Mayo, South Ireland, to Mary A. Duggan (*née* Brunt), of Long Sutton, Lincs., near Wisbech.

DEATHS.

BENTHALL.—On July 25th, at Priory-road, N.W., suddenly, Albert Benthall, F.R.C.P.E., aged 74.

ENGLEBACH.—On June 24th, at Cape Town, Harold Augustus Englebach, M.B., B.Ch. T.C.D., Medical Officer of S.A. Police and District Surgeon of Cape Town, aged 52 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

POSTURE IN THE TREATMENT OF DISEASE.

By R. H. Anglin Whitelocke, M.D. Edin., F.R.C.S. Eng.,

SURGEON TO THE RADCLIFFE INFIRMARY, OXFORD.

I PROPOSE to consider the subject of posture more especially as it may concern our dealings with sick children and their management. I shall begin by referring to the practical relationships of posture to ætiology and diagnosis, and later to treatment in various forms of disability in the adult as well as the child.

Posture in Relation to Ætiology and Diagnosis.

It not uncommonly happens that the individual, be he child or adult, assumes instinctively a posture by which his condition may be immediately recognised or which gives important indications as to his future management. The clinician also from time to time is wont to make systematic use of posture to assist him in diagnosis and to aid him in treatment. Posture as a cause of disease is chiefly important in connexion with occupation; thus whilst many persons suffer, and in various ways, from long-continued standing, there are others who are placed equally at a disadvantage from following sedentary occupations. Some who, like colliers and miners, have to work in constrained and unnatural positions are also liable to suffer in consequence. Posture is also of importance as predisposing to certain affections under peculiar and unusual circumstances and in modifying these effects. The recumbent position in low febrile states may lead to hypostatic congestion with its consequences, or to an accumulation of morbid products in the bronchi and lungs which may seriously endanger life. Positions adopted spontaneously by patients often give useful information in diagnosis. In cardiac and pulmonary diseases the individual may be quite unable to lie down owing to the interference with the respiratory functions; he is perforce compelled to sit up, lean forward, or be propped up in bed. In one-sided lung affections he may be only able to lie on one or other side, whilst in heart disease he may be quite unable even to lie on his left. The position generally assumed by the subjects of acute generalised peritonitis is so familiar to us all, and so characteristic, that it needs only to be mentioned to supply us with a very striking example of the value of morbid decubitus as a diagnostic asset. In the various spasmodic attacks of pain frequently associated with this part of the body and known as colic, it is very common to see the patient bending forwards in a doubled-up position and pressing upon the abdomen. In nervous affections also posture aids diagnosis.

It may reveal paralysis in various parts. In cerebral meningitis the subject lies usually in a state of complete flexion with the limbs and body curled forwards and brought together closely, and in cataleptic states any position assumed is usually retained for some considerable though variable time. The posture voluntarily assumed by a limb may give useful information as to local diseases likely to influence it, such as those of the joints, or draw attention to some injury.

Posture as a Therapeutic Measure.

Some of the facts already enumerated demonstrate to us clearly the value of posture also as a therapeutic measure. It will at once be evident that if a wrong posture is the cause of any disability or morbid condition, the first principle in treatment should be to set it right. It is often of great service to allow or even encourage a patient to adopt the position which makes him most comfortable at the particular time. Whenever general prostration and exhaustion are present the recumbent or semi-recumbent posture is clearly indicated as being the most restful, seeing that it involves a minimum of effort. In acute febrile conditions the first essential of treatment is to keep the subject recumbent in bed; and this is also desirable and advisable when excessive fatigue has been endured. In respiratory affections attention to posture is often of much service for symptoms associated with the breathing apparatus, such as pain, cough, and dyspnœa are in many cases peculiarly influenced by change of position. Coughing is often arrested and expectoration made easier by the assumption of a sitting or erect position, whilst the semi-prone or bending-forward position may help much in relieving any pressure upon the tubes.

All cardiac affections are more or less influenced by posture. The horizontal is invaluable in syncopal states since the head at a lower level than the body allows the blood to reach the brain more readily. Whenever the heart is acting feebly from any cause, the act of suddenly raising the patient even into the sitting posture is injudicious and may even cause death. On the other hand, there are conditions of the heart, as when it is dilated, when the individual is quite unable to lie down with any comfort. In such a case it may be quite necessary to have him propped up constantly; the beneficial result being sometimes almost miraculous. The influence of gravitation may be recognised in certain conditions such as dropsical accumulations and generalised anasarca. Even hæmorrhage may be rapidly diminished or even partially arrested on occasions by elevation of the bleeding limb or injured part.

In the treatment of such affections as sea-sickness, giddiness, neuralgia, headache, affections of the head and spine, change of position often brings relief. The varied positions into which the limbs are placed involuntarily to relieve muscular spasm, tension, or pain as the result of disease or injury, must not be lost sight of. In the feeble, and those who have been long confined to bed, it is essential that their positions should be changed periodically to diminish the risks of hypostatic congestion of the lungs and the development of bed-sores. The subjects of chronic cerebral and spinal diseases are also peculiarly liable to these postural disabilities.

Posture in Connexion with Surgical Operations.

Posture is an important factor in post-operative care and treatment. It is certainly one of the most powerful means available both of avoiding complications and hastening recovery. Many and varied are the positions used nowadays, and adapted for preventive and active treatment: (1) the Trendelenburg, or position of raised extremities; (2) the Sims, semi-prone or abdominal; (3) the Fowler, sitting or semi-erect. These may be used separately or in combination.

The Trendelenburg position has been extensively used by surgeons in the United States of America, mainly as a prophylactic agent in assisting to maintain the return of venous blood when for any reason it is hampered, either from a local or general cause. The Sims and Fowler positions are chiefly concerned in establishing and maintaining the drainage of morbid secretions and effusions from wounds or from the cavities and spaces within the body.

Venous thrombosis and its consequences have for many years past supplied a serious cause of anxiety and discomfiture to surgeons. Why the slight anatomical difference between the iliac veins should cause the left vein to be affected in this way at least 20 times more frequently than its fellow, and why the complication should occur usually in the second week after the operation and not before, and in post-operative cases rather than in those without operation, is difficult to understand, and is still to-day without satisfactory explanation. W. Meyer, who 23 years ago published a very interesting paper[1] concerning this serious complication, wrote again recently[2] that in his opinion "treatment by posture will prevent venous thrombosis to a certainty" if carried out regularly and systematically as a post-operative method in the Trendelenburg position. It would be gratifying to feel that so serious a complication might be overcome by such simple means as raising the lower end of the bed upon blocks so that the pelvis of the patient is higher than his thorax. Elevation of the thrombosed limb alone is not recommended. The whole true pelvis must be raised higher than the thorax and the posture adopted soon after the operation and maintained until all risks of thrombosis have passed—that is, for at least ten days. During this time breathing exercises are encouraged as part of the treatment.

The typical Sims's posture, with both arms of the patient pointing forwards while he rests principally on his *right* shoulder, is to my mind the most useful, efficient, and comfortable. If we put the subject of a perforated appendix in Sims's position immediately he is removed from the operating table to his bed, it will be seen that the true pelvis is now the highest point of the drainage system and not the lowest. Blood serum, wound secretions, bile, or any other intra-abdominal extravasated material will in this position run downwards by the shortest possible route, and find ready exit providing an adequate drainage-tube is used. The continuance of this position for the first 18 or 24 hours should be insisted upon—after this, a slight turning to the left is permitted. The usual dorsal decubitus is assumed on the third day, as by that time the discharge will have ceased or become greatly diminished. The foot of the bed should not be raised for the first two or three days, lest perchance any toxic material should flow towards the subphrenic spaces where absorption is known to be most active.

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[1] Rare Complications after Operations for Appendicitis, Annals of Surgery, May, 1901.

[2] Surg. Clinics of North America, 1921, i., 305.

Disadvantages of Fowler's Position.

Fowler's position, at one time so much extolled and almost universally used, is not now so much in favour. Instituted for the main purpose of establishing drainage and the removal of all toxic fluids towards the pelvis from the upper abdominal peritoneum by means of gravitation, it has been found in practice to present the following disability, which is not present in Sims's or the modified Sims's position. The Fowler position is often very uncomfortable; the patient keeps sliding downwards into the bed and requires to be raised periodically, a manœuvre not without danger. Children will seldom remain in this position for any length of time, and I claim that it is by no means an established fact that it is essential to successful drainage.

I consider that the gravitation theory is quite untenable, and for the following reasons: (1) Drainage of the pouch of Douglas can be quite successfully established through a midline anterior abdominal incision with the drainage-tube placed vertically and the flow against gravity. (2) The thorough drainage of abscesses and other morbid effusions that have escaped into any part of the peritoneal cavity, be it pelvic, appendicular, hepatic, gastric or intestinal, can be effected with the patient lying on his back even continuously, providing certain precautions are taken as to the nature and size of the tube. (3) Children seldom remain in the semi-erect Fowler posture for any length of time, yet who will say that the mortality of appendicitis is any higher in children? (4) Some surgeons who have never allowed the Fowler position at any time in their practice have yet obtained excellent results. That gravitation plays a very important part in abdominal, thoracic, or intracranial drainage is doubtful. The drainage of morbid substances from the body cavities outwards or from one part to another is mainly a vital process. The to-and-fro respiratory movements of the diaphragm and chest wall are undoubtedly the main agents; and drainage is effected by muscular movements rather than gravitation. The peritoneal cavity is normally a closed space with all the contained viscera in close apposition. Every movement of the diaphragm and abdominal muscles in the respiratory efforts presses the viscera, which are elastic and largely compressible, closely together in a to-and-fro rhythmic way. Any fluid or semi-fluid material that is present in, or has found its way into, either the abdominal or thoracic cavities is also similarly compressed. It now only needs a suitable opening, prevented from closing by the insertion of a proper drainage-tube, for automatic drainage to be established. In a similar manner, in the case of joints, the encouragement of movements materially assists drainage. In my opinion, the noticeable reduction in the mortality of appendicitis cases following the introduction of the Fowler and Murphy positions was probably not due to this postural form of treatment so much as to the contemporaneous use of saline injections.

Conclusion.

I wish to emphasise that in the nursing of children posture is especially important, and much, I think, may be gained for them in the future if the nursing profession is taught as a routine the methods of its application. The child instinctively and naturally assumes that position in which he is most comfortable, yet how often is he roused and put into some set position regardless of his protestations, only to lapse again as soon as possible into his old place.

PUBLIC HEALTH IN THE PUNJAB.*

THE population of the Punjab, according to the census of 1921, was 20,517,606, excluding dwellers in military cantonments. Calculated on this basis the birth-rate was 39·3, and the mortality-rate 22·1 per 1000. The health of the province was exceptionally good. Lieut.-Colonel W. H. C. Forster, I.M.S., Director of Public Health, who presents the report for 1922, states that the total death-rate was lower than it had been since 1878. He considers, however, that "if any improvement in the vital statistics is to be obtained, the preventive organisation will have to be expanded, such expansion of necessity connoting a corresponding curtailment of expenditure on the curative organisation." As to this there may be a difference of opinion, but the solution is, of course, that the better the preventive organisation, the less will be the sickness from preventable causes, and therefore the less will be the expenditure needed for treatment.

The *birth-rate* for the province was 39·3 per 1000, as compared with 41·5 in 1921 and 40·0 in the preceding quinquennium. The ratios varied from 21·0 in Simla district, 28·1 in Attock, and 28·8 in Muzaffargarh, to 46·6 in Gurgaon, [illegible] in Amritsar, and 49·1 in Lyallpur. All the districts in Lahore division, and all but one in Multan, showed an increase on the quinquennial average; while all in Rawal Pindi, and all but one in Jullundur, showed a decrease. The ratio for the province, as in the year preceding, was higher than in any other province in India, Central Provinces coming next (35·80); in Bengal the ratio was 27·4.

The *general death-rate* was 22·1 per 1000, a considerable improvement on the ratios for the preceding year (30·1), and for the quinquennium (39·2). The ratio is also lower than that for any other province, except the N.W. frontier (21·68) and Madras (21·0). In the various districts the mortality ranged from 15·2 in Montgomery and 15·4 in Sheikhupura, to 27·0 in Gurgaon and 30·8 in Karnal. The *infantile mortality* (under 1 year) showed a great improvement, 161·35 per 1000 births, as compared with 195·78 in 1921 and 211·23 for the previous five years. Among Mohammedans the ratios were 165·33 and 147·28, among Hindus 179·59 and 161·89, and for Indian Christians 89·57 and 71·26 for male and female infants respectively. For "other classes" the rates are stated as "4000·00 for males and 8400·00 for females." There is here a superabundance of ciphers. Possibly 400 and 840 are the ratios intended, or possibly 40 and 84 per 1000. The actual numbers of deaths are stated in Form IV., p. ix., as 52 males and 20 females.

Cholera had caused 19,215 deaths in the preceding year (0·94 per 1000); during 1922 there were 128 deaths (0·01 per 1000). 16 districts were affected, but only in Ambala was there an epidemic prevalence, with 78 deaths (0·12 per 1000), of which 75 occurred in June, July, and August. The first cases were recorded in Lahore in June, where the disease was introduced from Hardwar; Ludhiana district was next infected, also from Hardwar; then Ambala. The Sun Eclipse Fair at Thanesar (near Ambala) was attended by about 500,000 pilgrims. Cholera broke out, but there were only 16 cases and 8 deaths. This, the report states, speaks highly for the very efficient and elaborate arrangements made by the public health department to meet all contingencies. After the dispersal of the pilgrims one case and one death occurred in Panipat, but otherwise there was no spread of the disease in consequence of this Fair. It is to be hoped that some acknowledgment has been, or will be, made to the medical department for this magnificent success in dealing with a crisis of such urgency.

The *small-pox mortality* fell from 0·22 per 1000 in the previous year, and 0·33 in the quinquennium, to 0·08 (para. 23 and Form VIII.). Simla was quite free from the disease, and in the other districts the death-rate ranged from 0·002 in Karnal and in Ambala, to 0·33 in Lahore and 0·37 in Gujranwala. In the towns the ratio was 0·32, and in the rural areas 0·05; 114 out of the 156 towns escaped the disease altogether; in the remaining 42 there were 659 deaths; 286 of these occurred at Lahore (1·11 per 1000) and 159 at Gujranwala (4·20 per 1000).

There was an increase in *plague mortality* (7837 deaths, as compared with 2896 in 1921), but the death ratio (0·38 per 1000) was much less than the quinquennial average (1·21). Jhelum district suffered most with a ratio of 3·1; no other district exceeded 1·62 (Shahpur), and the whole of Ambala division, as well as Kangra, Hoshiarpur, Ferozepore, and Muzaffargarh districts were entirely free. The most noticeable feature in the history of the disease, says Colonel Forster, was the infection of Murree town. All indications point to the infection being introduced by infected fleas or rats carried in carts loaded with grain, fruit, or vegetables, but the outbreak was soon brought under control, and there were only eight deaths. It may be noted, he continues, that our hill stations have displayed a marked immunity to plague, Kasauli being the only other hill station definitely known to have suffered (in 1904). Rat destruction has been carried out systematically, and on the whole the attitude of the people towards anti-plague measures is improving. *Fever deaths* registered numbered 306,651 (14·95 per 1000, as compared with 20·62 in 1921, and 28·83 for the quinquennium). Karnal district suffered most (24·9), while in the adjoining district of Ambala the ratio was only 12·7 per 1000. Obviously it is not "climate," but local conditions that cause this mortality. This classification of relapsing fever may, however, account for some of this excessive death-rate. In the rural circles the fever mortality was 15·26, ranging from 10·47 in Sheikhupura (Lahore Division) and 10·71 in Jhang (Multan Division), to 19·15 in Mianwali (Rawal Pindi), 19·20 in Dera Ghazi Khan (Multan), and 25·69 in Karnal (Ambala). In the towns the mortality was 12·10. Gidarbaha in Ferozepore district and Chuharkana Mandi in Sheikhupura returned ratios of 0·77 and 0·78 per 1000 respectively; while at Kalabagh in Mianwali district the ratio was 28·11, and at Khudian (in Lahore) 42·16 per 1000.

The deaths recorded from *influenza* numbered 35, of which 13 occurred at Simla, where a mild form was somewhat prevalent throughout the year (115 cases). At Simla also diphtheria was *more* prevalent than usual, 28 cases and 3 deaths; 15 cases occurred at Bishop Cotton's school. The sanitary conditions were inspected, and remedial measures set in progress. Relapsing fever in a mild epidemic form was reported in the Hissar district early in the year; there were 150 cases and 78 deaths, In October it appeared also in a mild form in Rawal Pindi district (104 cases and 35 deaths); in the same month the disease broke out in a severe form in Muzaffagarh, but apparently was not recognised as such until December. "The extreme poverty and filthiness of the people rendered disinfection over such a wide area extremely difficult; most of the people had no clothes other than the vermin-infected rags that they wore." A rapid expansion of the system of district health officers is required to ensure prompt recognition of the disease. The adoption of a system of itinerating medical officers to give arsenical treatment is recommended. Typhus fever occurred in small outbreaks in Rawal Pindi district and in the Bhajji State (Simla Hills), but was quickly overcome; no typhoid prevalence is mentioned. A notable improvement is recorded in regard to *dysentery* and *diarrhœa*, the mortality from which was 0·34 per 1000, as compared with 0·58 in 1921 and 0·54 for the quinquennium. The ratio varied from 0·02 in Hoshiarpur and Sheikhupura districts, to 1·37 in Simla and 2·69 in Rawal Pindi. Respiratory diseases also showed a decrease, the mortality being 1·95 per 1000, against 2·72 and 2·47 for the preceding year and the quinquennium respectively. In Ambala and in Gurdaspur districts the ratios were 8:74 and 5·31. In Muzaffargarh and Shahpur only 0·21, and in Montgomery only 0·19 per 1000. *Deaths from injury* in the province numbered 6153, being in a ratio of 0·30, as compared with 0·32 per 1000 in 1921 and 0·34 for the quinquennium; most of these were from accident (4091). *Rabies* caused 130 deaths. At the Kasauli Pasteur Institute 1939 patients underwent treatment, against 1677 in the preceding year; 192 were Europeans. There were 7 deaths and 4 failures among Indians, apparently none among Europeans.

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* Lahore: Government Press. 1923.

In the appendix it is stated that "the present annual grant of 4 lakhs falls far short of the needs of the Sanitary Board, which was petitioned for aid during the year to the extent of 9 lakhs. On account of financial stringency no increase in the allotment could be made, but when circumstances permit, it is hoped that the Board will be accorded generous treatment."

Punjab Lunatic Asylum.

In the report for 1922* it is stated that the total number of inmates fell from 1248 in 1920 and 1204 in 1921 to 1168 in 1922, the decline being due to decrease in admissions from overseas; but the daily average strength rose from 862·81 in 1920 to 864·6 in 1921, and 867·2 in 1922. The report states that the accommodation of the asylum is taxed to its utmost at present. The percentage of cures to average strength was 13·03, as compared with 12·40 in 1920 and 15·96 in 1921. The death-rate, 6·69 per cent. of strength, showed a great improvement on the ratios for 1921 (11·22) and 1920 (12·63). Of the total 1168 cases, 139 (all males) were suffering from the effects of *Cannabis indica;* 90 were epileptics (71 males), 84 idiots (55 males), and 23 imbeciles (20 males); while 175 (162 males) are returned under melancholia. Among the 342 admissions during the year *Cannabis indica* insanity heads the list with 55 cases (all males), as stated on p. xxiii. (Statement vii.); in Statement vi. the number admitted is shown as 47. As there are three obvious press errors in this page (xvii.), it may be presumed that the figure in Statement vii. is more likely to be correct. In regard to the general health of the inmates, dysentery and diarrhœa, as usual, accounted for most of the admissions to hospital (83 cases and 7 deaths). In 1921 there had been 142 admissions for these diseases, with 21 deaths. A tuberculous section of the asylum was opened in 1921, and better facilities are now available for the diagnosis and treatment of this disease in its early stages; 52 cases were treated during the year. This report is signed by Col. R. Heard, I.M.S., Inspector-General of Civil Hospitals for the province, who states that Major H. W. V. Cox, I.M.D., was in charge until Nov. 13th and administered the asylum with zeal and marked ability. He was succeeded by Capt. C. J. L. Patch, M.C., I.M.S.

WHY IT CANNOT BE PUBLISHED

In the June number of the *Nation's Health*, an American journal, there is a paper with the above heading, in which Lowell V. Collins and Susa P. Moore have attempted to analyse the controlling factors in the acceptance and rejection of manuscripts. They refer to a famous writer, whose name they withhold, who traced much of his success to an early understanding of the significance of the rejection slips with which he, like all young writers, was submerged. With rare perspicuity he came to the conclusion that the fault lay with himself. They suggest to writers on health subjects that they consider the time and labour required by the readers of their writings as well as the time and labour required by the author. In this connexion they refer to the following instructive incident. A short article on a health subject was written hurriedly and then read by the author at a normal rate which took 15 minutes. He then revised and condensed it, taking 40 minutes in the process. It was now found that his message could be read in about 10 minutes, and that the style of his article had considerably improved. After publication it was estimated that 25,000 persons would read the article, and each would save five minutes because of the author's revision. "In this way, more than 2000 hours of profitless reading was avoided at the cost of 40 minutes' revision." Reading aloud his own manuscript is a discipline which, it is urged, every author should inflict on himself, and the advice is none the less good because so old. The procedure serves to emphasise the clumsiness of reiteration, the importance of proper punctuation, or the need for rearrangement. Potential authors are reminded that health articles should sparkle with interest and originality, having the power to pique curiosity and hold interest continuously, and here we feel definitely antagonistic to the mentors, for articles written with the intention to sparkle, to hold, or to pique form the gloomiest literature that masquerades as scientific.

PENAL REFORM.

We have received a copy of the third issue of the *Howard Journal*, the organ of the Howard League for Penal Reform, which is described as "a review of modern methods for the prevention and treatment of crime and juvenile delinquency." This number contains original articles on such subjects as crime and insanity, and the medical examination of delinquents, a long review of the report of the Prison Commission, foreign news, and book reviews; the total contents run to rather more than 80 pages. The Howard League stands for an educative and humane rather than a punitive policy in prison administration, and favours the abolition of the death penalty. Particular emphasis is laid on the need for medical examination and treatment in the numerous cases where crime is possibly attributable to mental defect or disorder.

A PROTECTIVE SHIELD FOR WOMEN SUFFERING FROM MENORRHAGIA.

Women with menorrhagia often suffer more from the dread of insufficient protection than from the physical discomfort of excessive menstrual flow, and a form of neurasthenia amounting to an anxiety state occasionally results in those who cannot lie up at these times. Nash's self-fixing "Surmeto" Hygienic Mene Shield is an all-rubber shield, easily cleaned, rather larger than an ordinary sanitary towel, in which the latter can be securely fixed through strips of rubber without difficulty, and no further anxiety as to possible leakage need occur. The shield can be obtained from chemists or drapers, or direct from the proprietors, Messrs. Nash and Sons, 29, Kyverdale-road, London, N. 16, for 2*s*. 6*d*.

UNSIGHTLY WARTS.

To the Editor of The Lancet.

Sir,—I should be grateful if any fellow practitioner could advise as to the treatment of small, multiple soft warts on the back of the hand. Cauterisation with nitric or glacial acetic acid produces very unsightly scars with the larger ones, and does not affect the smaller ones, only causing burns of the surrounding skin surface. Lime-water taken internally has had no effect. The warts are unsightly, and cause annoyance to the patient.

I am, Sir, yours faithfully,
G. S. Sander, M.D.

Claremont, Wateringbury, Kent, July 27th, 1924.

ARTIFICIAL RESPIRATION.

To the Editor of The Lancet.

Sir,—I have read with interest Dr. E. Seaborn's notes on the above subject in The Lancet of July 19th, and being a devoted M.O. to an ambulance division I fancy the same would find acceptance as an "occasional lecture." I notice that there is no allusion to "Laborde's method," and we teach that it is useful in cases (1) of injury of chest and shoulder-girdle, (2) in children, (3) in electric shock, and as supplementary to other methods under various circumstances. Moreover, personally, being a sufferer from bronchial asthma with dyspnœa, I have fancied that (in private of course) the forcible protrusion of the tongue a few times resulted in ampler inspiration. Whether this is merely due to the after-effect of holding the breath while the tongue is being protruded, or due to the nervous mechanism, I do not like definitely to assert.

I am, Sir, yours faithfully,
H. C. Lamport.

Lancaster, July 25th, 1924.

An Address

[ABRIDGED]

ON

PROGRESS AND PROSPECTS IN CHEMOTHERAPY.

Delivered before the Section of Physiology of the British Association at Toronto on August 6th, 1924,

BY H. H. DALE, C.B.E., M.D. CAMB., F.R.S.,

PRESIDENT OF THE SECTION; DIRECTOR OF THE DEPARTMENT OF BIOCHEMISTRY AND PHARMACOLOGY AT THE NATIONAL INSTITUTE OF MEDICAL RESEARCH, HAMPSTEAD, LONDON.

THE THEORETICAL ORIGIN OF CHEMOTHERAPY.

CHEMOTHERAPY may be defined as the specific treatment of infections by artificial remedies. The object of those who study it is to find new remedies which will cure or arrest diseases due to infections, not by alleviating the symptoms or invigorating the patient, but by directly and specifically suppressing the infection. Chemotherapy, in this wide sense, is not entirely of recent growth. When the natives of Peru discovered the value in fevers of the cinchona bark, which the Jesuits brought to Europe in the seventeenth century, they had found a specific remedy for malaria, which is still the best available. Similarly the natives of Brazil had found in ipecacuanha, which reached Europe shortly after cinchona, a remedy for amœbic dysentery better than any other which our modern systematic and scientific efforts have produced. Modern chemistry, indeed, has separated the alkaloids from these drugs, and has made it possible to identify among them the actively therapeutic constituents; protozoology has revealed the nature of the infections. We know now that cinchona owes its curative action chiefly to quinine and quinidine, and that they act as specific exterminators of the malaria parasites, and not simply as remedies for fevers *in general*; and we know that ipecacuanha owes its action to emetine and cephaline, and that these act as exterminators of the entamœba causing tropical dysentery, and not simply as symptomatic remedies for dysenteries of any kind. But chemistry has produced no better remedy for malaria than quinine, or for amœbic dysentery than emetine; and the method by which either of these alkaloids cuts short the infection by a particular parasite, the nature of its specific action remains a fascinating problem.

The modern development of chemotherapy, as a new department in therapeutic science, claiming the coöperation of parasitologists, micro-biologists, and synthetic chemists, did not take origin, however, simply from the study of these traditional remedies. It may be regarded rather as an outcome of the study of the natural antibodies. The investigation of these natural antagonists to infection produced a new therapeutic ideal. Not only had they shown themselves to have an intensly specific affinity for the infecting organism of the toxin which caused their production, they were also perfectly harmless to the patient, behaving, in relation to his organism, as normal constituents of his body fluids and tissues. Ehrlich aptly compared them to magic bullets, constrained by a charm to fly straight to their specific objective, and to turn aside from anything else in their path.

Of the artificial remedies, on the other hand, which man had empirically discovered, even of drugs like those just mentioned as being specific for certain infections, the best that could be hoped was that they would eliminate the parasite before they poisoned the patient. And thus, when the limitations of natural immunity were becoming clearer, when it was realised that to certain forms of infection, several of which had proved to be infections by protozoa, the body was unable to produce antibodies of sufficient potency to eliminate the infection and leave the patient immune, the question arose whether, with the new and growing powers afforded by synthetic chemistry, man could not so far rival Nature's achievements as to produce, in the laboratory, substances specifically adapted to unite with and kill the protoplasm of these parasites, as the natural antibodies united with that of others, and to leave the tissues of the patient similarly unaffected. The ideal of this new and systematic chemotherapy, as the imaginative genius of Paul Ehrlich conceived it, was to be the production by synthesis of substances with a powerful specific affinity for, and a consequent toxic action on, the protoplasm of the parasites, and none for that of the host—of substances, to use Ehrlich's own terminology, which should be maximally parasitotropic and minimally organotropic.

I want to invite attention to the results which, during the last 20 years, have been produced under the stimulus of this bold conception; not, indeed, to attempt a survey or summary of all that has been done, but, in the light of a few of the suggestive facts which have emerged, to consider how far this hypothesis has justified itself, and whether it can be accepted as a safe guide to future progress, as it has undoubtedly provided the initiative and working basis for much of what has been accomplished hitherto. Before we deal with some of the actual results obtained, it may be well to consider a little more closely what Ehrlich's working hypothesis involved. The problem was to discover, by chemical synthesis, a compound which, in virtue of its chemical structure, should have a maximal affinity for the protoplasm of a microscopic parasite, such as a trypanosome, and a minimal affinity for that of the host's body cells. These affinities were pictured by Ehrlich, in the terms of his side-chain theory, as determined by certain side-chains of the complex protein molecule, or chemoreceptors, which endowed the protoplasm with specific combining properties. When it is remembered that knowledge of the chemistry of the protoplasm of a trypanosome is almost nil, and that what little we do know suggests that *it is very similar* to that of our own cells, it will be admitted that the enterprise was one calling for scientific courage and imagination in the highest degree. Complete failure would not have been surprising; the matter for surprise, and for admiration, is that so large a measure of practical success should, at the end of two decades, already claim record.

TRYPANOSOMES AND SPIROCHÆTES.

The Action of Dyes and Analogous Compounds.

The investigations leading, in the last few years, to a clear promise, at last, of the successful treatment of the diseases in man and animals due to infections with trypanosomes had at least two different starting-points, the action of dyes and the action of arsenic. Ehrlich's early interest in the synthetic dyes, and his observations of the curiously selective distribution which they often exhibited among the cells and tissues of the body, naturally suggested the possibility of finding in this group a substance which would selectively fix itself to the parasite and poison its protoplasm without injuring that of the host.

[Dr. Dale then described the steps whereby the compounds "trypan red" and "trypan blue" were arrived at by Ehrlich and Shiga, and Mesnil and Nicolle respectively. He proceeded :]

"Trypan blue" is the only one of the dyes which has hitherto had a genuine practical success in the treatment of a protozoal infection, not indeed by a trypanosome, but by an intracorpuscular parasite of the genus piroplasma, which infects dogs and cattle. This successful application of trypan blue to an animal disease has a special interest, in that it resulted from the joint labours of last year's President of this section, Prof. G. H. Nuttall, with a Canadian collaborator, Dr. Hadwen.

We may turn aside at this point to inquire how far the results even of these earlier investigations corresponded with the theory which gave them their impetus. Did these dyes really act by selectively staining and killing the parasites and leaving the host's cells untouched? The evidence was certainly not in favour of such a view. One point, however, appeared very significant, and it is met repeatedly in studying the action of effectively chemotherapeutic substances—namely, that the trypanosomes treated with the dye in vitro, though neither obviously stained nor visibly harmed, had lost their power of infection, and died out promptly if introduced into the body of a mouse. Under such conditions only minimal traces of the dye are introduced into the animal, and we are left with a series of alternative possibilities. It is possible that sufficient dye has been taken up by the trypanosomes to kill them eventually, the period of survival in vitro being inadequate to display its action; or that trypan red is converted by the influence of the body fluids and tissues into something which is effectively lethal for the parasite; or, again, that the effect of the drug is not directly to kill the trypanosomes, but, leaving their individual vitality and motility unimpaired, so to modify them that they have lost the power of rapidly reproducing themselves and invading the fluids and tissues of the mouse's body—in other words, have lost that complex of adjustments to the various factors of the host's natural resistance which we crudely summarise as "virulence." Such possibilities involve either storage or modification of the dye by the host's tissues, or their essential coöperation in its curative effect.

One other active dye must be mentioned as providing the link with a recent, most important advance. Mesnil and Nicolle in 1906 made some promising experiments with a dye, Afridol violet, which differed from any previously tested in that its central nucleus was diamino-diphenyl-urea. From this time onwards there was no further public indication of progress along these lines until 1920, when Handel and Joetten published the results obtained with a remarkable substance which, as the result of some 15 years of continuous work by their scientific staff, had been introduced by the great dye and chemical firm of Bayer. This substance, which is not a dye, but the colourless, water-soluble salt of a complex sulphonic acid, has hitherto been known as Bayer "205," and, for reasons which need not concern us, the firm decided not to publish its formula. There is a reasonable probability that its identity has now been settled by the recent work of Fourneau and his co-workers in the Pasteur Institute, who made and investigated an extensive series of compounds of this general type, and found one, which they numbered "309," which conspicuously excelled all others, even those closely related to it, in the favourable ratio which it displayed, between a just toxic dose and that which caused a trypanosome infection in mice to disappear. At least it may be said that, if Mr. Fourneau has not identified Bayer "205," he has discovered another compound having very similar, and probably as valuable, properties. The most remarkable property of "205" is the long persistence of its effect. A dose injected into a mouse, a rabbit, or a rat will not only free the animal, if already infected, from trypanosomes in a few days, but will also render it resistant to such infection for a period of weeks or even months. During that period its serum, or extracts from certain of its organs, exhibit a curative action if injected into another animal infected with trypanosomes.

Though there seems no reason to doubt that this substance has cured a number of cases of African sleeping-sickness in man, even some in which the disease was well advanced and in which all previously known remedies had failed, the mode of its action still presents a number of attractive obscurities. One thing seems perfectly clear—namely, that the action is a very complex one, involving the coöperation, in some way, of the host. For here again it is found that the curative action, on infections by the same strain of trypanosomes, varies enormously with the species infected, a mouse being cured with ease, an ox or a horse with difficulty or not at all. A curious fact is that the rapidly progressive and fatal infections produced in mice by certain pathogenic trypanosomes are easily and certainly cured, while the apparently harmless natural infection, seen in many wild rats, by *T. lewisi* is not affected at all. Then there are some curious records of treatment in man, in which the symptoms of sleeping-sickness have disappeared, but the trypanosomes are still found in the cerebro-spinal fluid suggesting that, though the parasites have not been killed, they have lost their virulence and their power of invading the brain substance.

It would be both useless and presumptuous for a mere onlooker to speculate in detail on the significance, for the curative action of "205," of properties which are only now beginning to be investigated. One conclusion, however, I think we are entitled to draw. It is sufficiently evident that here is no question of a substance curing simply on account of its affinity for parasites and lack of affinity for the host's tissues. What direct action on the parasite "205" itself may possess has still to be demonstrated; we may feel reasonably certain, on the other hand, that its affinities for the constituents of the host's blood and tissues play an important part in its remarkable and peculiar curative properties.

Derivatives of Arsenic.

In the case of the other series of investigations which I mentioned, that dealing with the organic derivatives of arsenic, we find again many difficulties, in the way of the simple theory, of a cure due to distribution by chemical affinities. None of the compounds of this series, which have reached practical trial and success in the treatment of spirochætal or trypanosomal infections, atoxyl, salvarsan, or tryparsamide, has a directly lethal action on the parasites in dilutions at all comparable to those which can be safely and effectively produced in the body of the host. The paradox of this direct inertness of atoxyl, the starting-point of the series, seemed to be explained when Ehrlich showed that its reduction to the corresponding arsenoxide produced a substance with an intense directly lethal action on trypanosomes. Similarly the partial oxidation of salvarsan, to the corresponding arsenoxide, produced a substance having the intensely lethal action on spirochætes or trypanosomes in vitro which salvarsan itself conspicuously and paradoxically lacked. In these cases, we may make the supposition, which Voegtlin and his co-workers especially have recently supported by detailed evidence, that the reduction or oxidation effected by contact with the tissues is the essential preliminary to the curative action; a supposition which, it will be noted, again introduces the host as an essential participant in the cure. The fact that the administration of these relatively inactive predecessors is therapeutically more effective than the injection of the directly active oxides derived from them, would then be explained on the assumption that the slow liberation of these latter in the body, at a rate which never produces a high concentration, provides the optimum condition for their persistent action on the parasites without danger to the host. This slow and persistent liberation of the directly active substance would be favoured by the physical properties of salvarsan, which at the reaction of the body is practically insoluble, and must be rapidly deposited after injection.

In their recent work on the action of tryparsamide, the compound, prepared by Jacobs and Heidelberger at the Rockefeller Institute, which has shared with Bayer "205" the credit of making the eventual conquest of African sleeping-sickness a hopeful possibility, Brown and Pearce find it necessary to introduce yet other considerations to explain its effects. Tested by Ehrlich's therapeutic index—the ratio between the lowest curative and the highest non-toxic dose—it gives a relatively unfavourable figure. Brown and Pearce practically abandon the attempt to account for its action on the supposition that it directly kills the parasites, and attribute its value largely to its power of penetrating easily into the tissues and reinforcing there the processes of natural resistance.

Action of Bismuth.

Another conception of the mode of action of these arsenical remedies, also involving a direct participation in the host's tissues, was put forward by Levaditi. He found that from atoxyl a directly parasiticidal preparation could be obtained by incubating it with an emulsion of fresh liver substance. As the first step, therefore, in the curative action of atoxyl, he postulated a combination of its reduction product with some constituent of the liver or other tissue, giving rise to the essential curative complex, which he named "trypanotoxyl." Levaditi's observations were explained by Ehrlich and Roehl as due simply to the reducing action of the liver substance on atoxyl; but it would be difficult to apply this explanation to the quite recently published observations by Levaditi and his colleagues on the mode of action of bismuth in curing spirochætal infections. A sodium potassium bismuthyl tartrate—a bismuth analogue of tartar emetic—had been found to have valuable curative properties in syphilis and other spirochætal infections. Later, various other bismuth salts, bismuth suboxide, and even finely divided metallic bismuth, were found to produce similar effects. According to Levaditi and Nicolau, these preparations have, by themselves, a relatively weak action, or none at all, on the spirochætes outside the body. If they are mixed, however, with a cell-free extract of liver, which is itself harmless to spirochætes, the mixture, after incubation, acquires a potent spirochæticidal action. The possibility of a mere reducing action of the liver extract seems here to be excluded, since bismuthous oxide, or metallic bismuth itself, yields a spirochæticidal mixture, containing Levaditi's hypothetical "bismoxyl," when incubated with the liver extract. If these observations are confirmed, there will be a strong indication that some cell-constituent enters into the composition of, or is essential to the formation of, the directly active substance from any of the derivatives of arsenic, antimony, or bismuth, as a preliminary to its action on an infection due to a trypanosome or a spirochæte. Again we have evidence of an organotropic property of the remedy, as an essential condition of its activity.

Resistant Strains of Trypanosomes.

In the phenomena of the acquisition of resistance by a strain of infecting trypanosomes to a particular curative drug we meet again with facts which can only with the greatest difficulty be reconciled with the assumption that the drug directly attacks the parasites. It was found, for example, that if a mouse infected with trypanosomes received an incompletely effective series of doses of atoxyl, the trypanosomes appearing in the blood at each relapse were more and more resistant to the drug, until they could not be caused to disappear by any dose of atoxyl which the mouse would tolerate. The strain, having once acquired this resistance, would retain it, on passage through an indefinitely long series of mice, without further treatment. Mesnil and Brimont, however, made the remarkable observation that, if the strain of trypanosomes was transferred to a rat, it immediately became in that animal susceptible again to treatment with atoxyl, remained so as long as it was kept in rats, to reacquire its old resistance to atoxyl as soon as it was retransferred to mice. Such a fact seems to be not at all explicable on the theory that the directly active agent, to which the trypanosome becomes resistant, is a mere reduction product of atoxyl; it is much more easily reconciled with a mechanism such as that described by Levaditi, in which a constituent of the host's tissues enters into the formation of the trypanocidal substance. We can imagine the trypanosome becoming immune to Levaditi's mouse-trypanotoxyl, and remaining susceptible to the corresponding rat-product.

SUGGESTED REACTION OF AN ARSENOXIDE WITH A SULPHYDRILE COMPOUND.

A recent suggestion by Voegtlin has interest in making at least an attempt at interpretation of these phenomena in definite biochemical terms. Voegtlin and his co-workers point out that arsenious oxide and its derivatives readily combine with substances containing a sulphydrile grouping, and find that the toxic action of the organic arsenoxides on trypanosome and mammal alike is depressed by the simultaneous injection of excess of various sulphydrile compounds.

$$\text{R·As} : \text{O} + \frac{\text{HS·R}}{\text{HS·R}} = \text{R·As}\begin{matrix}\diagup\text{S·R}\\ \diagdown\text{S·R}\end{matrix} + \text{H}_2\text{O}.$$

The work of Gowland Hopkins showing the importance of one such sulphydrile compound, reduced glutathione, in the hydrolytic oxidation-reduction processes of the cell suggests to Voegtlin that a combination with such groups, and consequent suppression of this vital function, may explain the toxic and curative actions of the arsenical derivatives, and that a formation by the trypanosome of the sulphydrile compound, in excess of its vital need, may be the basis of acquired resistance. If certain dyes similarly affect this cellular oxidation system, the production under their influence of strains of trypanosomes resistant to arsenic would also be explained. So stated the suggestion leaves many aspects of the problem still unconsidered; but it may at least be allowed the merit of an attempt to interpret the action of these drugs in terms of known biochemical facts.

EMETINE AND DYSENTERY.

To turn to another example of a chemotherapeutic problem, I may mention briefly some results obtained some years ago by Mr. Clifford Dobell and myself in an attempt to explore the curative action of emetine and the other alkaloids of ipecacuanha in amœbic dysentery with a view to finding a more effective treatment. At the time when we took up the problem it seemed simple. Leonard Rogers had recorded that the amœbæ obtained from a case of amœbic dysentery, and treated in vitro with emetine, were rapidly killed by the alkaloid in dilutions as high as one part in 100,000. This seemed to explain the action of emetine as a simple and direct one on the parasites, and to provide a rapid method for testing a series of compounds for their therapeutic possibilities. We failed, however, as other observers before and since have done, to confirm the observation; on the contrary, we found that the dysenteric amœbæ, obtained from cats secondarily infected, or, in a control observation, directly from man, were surprisingly insusceptible to the action of emetine, living for hours in concentrations much greater than the highest which they would tolerate of other alkaloids, which had no curative action in dysentery. One of the other natural alkaloids of ipecacuanha, methyl-psychotrine, and certain artificial derivatives of emetine, were much more effective in killing the amœbæ in the test-tube, and at the same time were practically devoid of the characteristic toxicity of emetine and cephæline for mammals and for man. Here, on the classical assumption of chemotherapy, should have been ideal remedies for amœbic infection—substances much more parasitotropic and much less organotropic than those already known to be effective. Yet each of them in turn, when administered to patients suffering from amœbic dysentery, in doses much larger than those in which emetine could be tolerated, produced no effect whatever on the dysentery, which promptly cleared up when emetine was subsequently given. Among the members of this group of alkaloids which were tried, the curative effect seemed to be proportional rather to their toxic and nauseating action on the patient, than to their lethal action on the isolated amœbæ. Yet emetine and cephæline are not mere symptomatic remedies; they definitely stop the progress of infection by the amœbæ, and, properly administered, eliminate them altogether from the body.

We may turn aside at this point to inquire how far the results even of these earlier investigations corresponded with the theory which gave them their impetus. Did these dyes really act by selectively staining and killing the parasites and leaving the host's cells untouched? The evidence was certainly not in favour of such a view. One point, however, appeared very significant, and it is met repeatedly in studying the action of effectively chemotherapeutic substances—namely, that the trypanosomes treated with the dye in vitro, though neither obviously stained nor visibly harmed, had lost their power of infection, and died out promptly if introduced into the body of a mouse. Under such conditions only minimal traces of the dye are introduced into the animal, and we are left with a series of alternative possibilities. It is possible that sufficient dye has been taken up by the trypanosomes to kill them eventually, the period of survival in vitro being inadequate to display its action; or that trypan red is converted by the influence of the body fluids and tissues into something which is effectively lethal for the parasite; or, again, that the effect of the drug is not directly to kill the trypanosomes, but, leaving their individual vitality and motility unimpaired, so to modify them that they have lost the power of rapidly reproducing themselves and invading the fluids and tissues of the mouse's body—in other words, have lost that complex of adjustments to the various factors of the host's natural resistance which we crudely summarise as "virulence." Such possibilities involve either storage or modification of the dye by the host's tissues, or their essential coöperation in its curative effect.

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It would be both useless and presumptuous for a mere onlooker to speculate in detail on the significance, for the curative action of "205," of properties which are only now beginning to be investigated. One conclusion, however, I think we are entitled to draw. It is sufficiently evident that here is no question of a substance curing simply on account of its affinity for parasites and lack of affinity for the host's tissues. What direct action on the parasite "205" itself may possess has still to be demonstrated; we may feel reasonably certain, on the other hand, that its affinities for the constituents of the host's blood and tissues play an important part in its remarkable and peculiar curative properties.

Derivatives of Arsenic.

In the case of the other series of investigations which I mentioned, that dealing with the organic derivatives of arsenic, we find again many difficulties, in the way of the simple theory, of a cure due to distribution by chemical affinities. None of the compounds of this series, which have reached practical trial and success in the treatment of spirochætal or trypanosomal infections, atoxyl, salvarsan, or tryparsamide, has a directly lethal action on the parasites in dilutions at all comparable to those which can be safely and effectively produced in the body of the host. The paradox of this direct inertness of atoxyl, the starting-point of the series, seemed to be explained when Ehrlich showed that its reduction to the corresponding arsenoxide produced a substance with an intense directly lethal action on trypanosomes. Similarly the partial oxidation of salvarsan, to the corresponding arsenoxide, produced a substance having the intensely lethal action on spirochætes or trypanosomes in vitro which salvarsan itself conspicuously and paradoxically lacked. In these cases, we may make the supposition, which Voegtlin and his co-workers especially have recently supported by detailed evidence, that the reduction or oxidation effected by contact with the tissues is the essential preliminary to the curative action; a supposition which, it will be noted, again introduces the host as an essential participant in the cure. The fact that the administration of these relatively inactive predecessors is therapeutically more effective than the injection of the directly active oxides derived from them, would then be explained on the assumption that the slow liberation of these latter in the body, at a rate which never produces a high concentration, provides the optimum condition for their persistent action on the parasites without danger to the host. This slow and persistent liberation of the directly active substance would be favoured by the physical properties of salvarsan, which at the reaction of the body is practically insoluble, and must be rapidly deposited after injection.

In their recent work on the action of tryparsamide, the compound, prepared by Jacobs and Heidelberger at the Rockefeller Institute, which has shared with Bayer "205" the credit of making the eventual conquest of African sleeping-sickness a hopeful possibility, Brown and Pearce find it necessary to introduce yet other considerations to explain its effects. Tested by Ehrlich's therapeutic index—the ratio between the lowest curative and the highest non-toxic dose—it gives a relatively unfavourable figure. Brown and Pearce practically abandon the attempt to account for its action on the supposition that it directly kills the parasites, and attribute its value largely to its power of penetrating easily into the tissues and reinforcing there the processes of natural resistance.

Action of Bismuth.

Another conception of the mode of action of these arsenical remedies, also involving a direct participation in the host's tissues, was put forward by Levaditi. He found that from atoxyl a directly parasiticidal preparation could be obtained by incubating it with an emulsion of fresh liver substance. As the first step, therefore, in the curative action of atoxyl, he postulated a combination of its reduction product with some constituent of the liver or other tissue, giving rise to the essential curative complex, which he named "trypanotoxyl." Levaditi's observations were explained by Ehrlich and Roehl as due simply to the reducing action of the liver substance on atoxyl; but it would be difficult to apply this explanation to the quite recently published observations by Levaditi and his colleagues on the mode of action of bismuth in curing spirochætal infections. A sodium potassium bismuthyl tartrate—a bismuth analogue of tartar emetic—had been found to have valuable curative properties in syphilis and other spirochætal infections. Later, various other bismuth salts, bismuth suboxide, and even finely divided metallic bismuth, were found to produce similar effects. According to Levaditi and Nicolau, these preparations have, by themselves, a relatively weak action, or none at all, on the spirochætes outside the body. If they are mixed, however, with a cell-free extract of liver, which is itself harmless to spirochætes, the mixture, after incubation, acquires a potent spirochæticidal action. The possibility of a mere reducing action of the liver extract seems here to be excluded, since bismuthous oxide, or metallic bismuth itself, yields a spirochæticidal mixture, containing Levaditi's hypothetical "bismoxyl," when incubated with the liver extract. If these observations are confirmed, there will be a strong indication that some cell-constituent enters into the composition of, or is essential to the formation of, the directly active substance from any of the derivatives of arsenic, antimony, or bismuth, as a preliminary to its action on an infection due to a trypanosome or a spirochæte. Again we have evidence of an organotropic property of the remedy, as an essential condition of its activity.

Resistant Strains of Trypanosomes.

In the phenomena of the acquisition of resistance by a strain of infecting trypanosomes to a particular curative drug we meet again with facts which can only with the greatest difficulty be reconciled with the assumption that the drug directly attacks the parasites. It was found, for example, that if a mouse infected with trypanosomes received an incompletely effective series of doses of atoxyl, the trypanosomes appearing in the blood at each relapse were more and more resistant to the drug, until they could not be caused to disappear by any dose of atoxyl which the mouse would tolerate. The strain, having once acquired this resistance, would retain it, on passage through an indefinitely long series of mice, without further treatment. Mesnil and Brimont, however, made the remarkable observation that, if the strain of trypanosomes was transferred to a rat, it immediately became in that animal susceptible again to treatment with atoxyl, remained so as long as it was kept in rats, to reacquire its old resistance to atoxyl as soon as it was retransferred to mice. Such a fact seems to be not at all explicable on the theory that the directly active agent, to which the trypanosome becomes resistant, is a mere reduction product of atoxyl; it is much more easily reconciled with a mechanism such as that described by Levaditi, in which a constituent of the host's tissues enters into the formation of the trypanocidal substance. We can imagine the trypanosome becoming immune to Levaditi's mouse-trypanotoxyl, and remaining susceptible to the corresponding rat-product.

SUGGESTED REACTION OF AN ARSENOXIDE WITH A SULPHYDRILE COMPOUND.

A recent suggestion by Voegtlin has interest in making at least an attempt at interpretation of these phenomena in definite biochemical terms. Voegtlin and his co-workers point out that arsenious oxide and its derivatives readily combine with substances containing a sulphydrile grouping, and find that the toxic action of the organic arsenoxides on trypanosome and mammal alike is depressed by the simultaneous injection of excess of various sulphydrile compounds.

$$R\cdot As:O + \frac{HS\cdot R}{HS\cdot R} = R\cdot As\begin{array}{l}\diagup S\cdot R\\ \diagdown S\cdot R\end{array} + H_2O.$$

The work of Gowland Hopkins showing the importance of one such sulphydrile compound, reduced glutathione, in the hydrolytic oxidation-reduction processes of the cell suggests to Voegtlin that a combination with such groups, and consequent suppression of this vital function, may explain the toxic and curative actions of the arsenical derivatives, and that a formation by the trypanosome of the sulphydrile compound, in excess of its vital need, may be the basis of acquired resistance. If certain dyes similarly affect this cellular oxidation system, the production under their influence of strains of trypanosomes resistant to arsenic would also be explained. So stated the suggestion leaves many aspects of the problem still unconsidered; but it may at least be allowed the merit of an attempt to interpret the action of these drugs in terms of known biochemical facts.

EMETINE AND DYSENTERY.

To turn to another example of a chemotherapeutic problem, I may mention briefly some results obtained some years ago by Mr. Clifford Dobell and myself in an attempt to explore the curative action of emetine and the other alkaloids of ipecacuanha in amœbic dysentery with a view to finding a more effective treatment. At the time when we took up the problem it seemed simple. Leonard Rogers had recorded that the amœbæ obtained from a case of amœbic dysentery, and treated in vitro with emetine, were rapidly killed by the alkaloid in dilutions as high as one part in 100,000. This seemed to explain the action of emetine as a simple and direct one on the parasites, and to provide a rapid method for testing a series of compounds for their therapeutic possibilities. We failed, however, as other observers before and since have done, to confirm the observation; on the contrary, we found that the dysenteric amœbæ, obtained from cats secondarily infected, or, in a control observation, directly from man, were surprisingly insusceptible to the action of emetine, living for hours in concentrations much greater than the highest which they would tolerate of other alkaloids, which had no curative action in dysentery. One of the other natural alkaloids of ipecacuanha, methyl-psychotrine, and certain artificial derivatives of emetine, were much more effective in killing the amœbæ in the test-tube, and at the same time were practically devoid of the characteristic toxicity of emetine and cephæline for mammals and for man. Here, on the classical assumption of chemotherapy, should have been ideal remedies for amœbic infection—substances much more parasitotropic and much less organotropic than those already known to be effective. Yet each of them in turn, when administered to patients suffering from amœbic dysentery, in doses much larger than those in which emetine could be tolerated, produced no effect whatever on the dysentery, which promptly cleared up when emetine was subsequently given. Among the members of this group of alkaloids which were tried, the curative effect seemed to be proportional rather to their toxic and nauseating action on the patient, than to their lethal action on the isolated amœbæ. Yet emetine and cephæline are not mere symptomatic remedies; they definitely stop the progress of infection by the amœbæ, and, properly administered, eliminate them altogether from the body.

Yet another puzzling observation, made by Dobell and myself, was that an amœbic infection which readily yielded to treatment with emetine in man was entirely uninfluenced by emetine when transferred to the cat. In no way is it possible to account for these facts without admitting a coöperation of the patient's tissues in the curative action; nor, with that admission, can we do more than consider possibilities. We only know that the truly parasitic *Entamœba histolytica*, which cannot live without invading the tissues, can be checked in this invasion and eliminated from the body by administering emetine, while other entamœbæ, which live on fæcal debris, remain unharmed. Whether the tissues are so altered that the amœbæ cannot invade them, or the amœbæ, without being directly killed, are so weakened in virulence that they cannot invade the tissue and obtain their food, but succumb in face of the normal resisting powers of the host, are possibilities on which we can only speculate, and no method of bringing them to the test of experiment has yet been found.

The work of Morgenroth and his co-workers, extending now over more than a decade, has again led them to emphasise, in connexion with the curative action of substances which they have examined, a fixation to the cells and tissues of the host, a definitely organotropic property, as an important factor in the effect. Two examples may be mentioned.

Quinine and Malaria.

One of the earliest of chemotherapeutic discoveries, that of the cure of malaria by quinine, had never been satisfactorily explained. There was no evidence establishing even a probability that quinine, in such concentrations as can be tolerated in the blood of the living subject, would directly kill the malarial plasmodia, especially if these were partly screened from its action by their position in the interior of the red corpuscles. Morgenroth, from the results of his determinations by biological methods of the distribution of quinine in blood, is led to the conception of quinine as acting on malaria, in virtue of its fixation by the red corpuscles, either killing the trophozoites in their interior, or blocking the entry into them of the merozoites of the asexual cycle. On this latter supposition it will be seen that quinine would act, not by killing the malarial parasites, but by rendering the blood unfitted for their multiplication. They are supposed to fall a prey to the natural defensive substances in the plasma, because a film of quinine denies them access to the red corpuscles, in the interior of which they could continue their development in safety. There are discrepancies between Morgenroth's determinations of the distribution of quinine in favour of the red corpuscles and those obtained by direct chemical means which would still need to be reconciled before either theory of the curative process in malaria could be fully accepted. Meanwhile, these suggestions are of interest as another example of the need found more and more by workers in this field, to regard an organotropic property of a drug, not as detrimental to its curative action, but as an essential factor in the chemotherapeutic process.

Remedies for Bacterial Infections.

This same property of fixing themselves to the red blood corpuscles or to the connective tissue has been observed by Morgenroth and his co-workers with the higher homologues of quinine, ethylhydrocupreine ("optochin"), and octylhydrocupreine ("vuzin"), and with the dyes of the acridine series, with which they have obtained promising results in the treatment of bacterial infections. In the treatment of pneumococcus infections by optochin several factors, other than those of immediately lethal action of the alkaloid on the pneumococci, appear to be concerned. Evidence was obtained by Moore, for example, which suggested that the defensive reaction of the host was an essential factor in the cure, optochin, in doses inadequate to kill the pneumococci, rendering them liable to the action of specific antibodies; and some experiments of Felton and Dougherty suggest that an excessive dose of an alkaloid of this class, by suppressing the natural defensive reaction, may even allow the fatal spread of an infection which a lower dose would cure. Morgenroth, on the other hand, emphasises the part played by the organotropic properties of optochin and vuzin in enabling the red corpuscles to act as carriers of the drug to the point of action, and the connective tissues to form local depôts of it.

An acridine dye, named trypaflavin, was under study in Ehrlich's laboratory in 1914 as a trypanocidal remedy, and was found during the war by Browning and his co-workers to have valuable properties as an antiseptic for infected wounds and mucous membranes, for which, under the name "acriflavine" it is still used. Since the war other dyes of this series have been investigated by Morgenroth and his school, and one of them, called "rivanol" (2-ethoxy 6, 9 diamino acridine), is stated to be particularly effective as a tissue antiseptic, especially in conditions of spreading infection due to streptococci. In the case of "rivanol" also, evidence has been brought forward that it is fixed by the red corpuscles and the subcutaneous tissues, protected thereby from excretion, or held at the point where its curative action is required. From these body cells it is suggested that the dye is gradually given up to the cocci, on which its action is exerted, by a process called "transgression" by Morgenroth. This is a process by which a substance is passed from one medium to another, when both have strong affinities for it, through a layer of an intervening medium for which it has no affinity, and in which it may be almost insoluble. In this process of depôt formation and gradual liberation of the active substance we are concerned with a phenomenon which certainly has a widespread importance for chemotherapeutic action. We have earlier seen evidence of such fixation and gradual release in the cases of Bayer "205" and salvarsan.

Another suggestive feature of the action of "rivanol" on streptococcal infections is that such organisms as escape the immediately lethal effect of the dye appear to have lost their hæmolytic properties, and to have been modified into a relatively avirulent strain.

Conclusion.

We have considered but a few examples of the directions in which chemotherapeutic investigation has proved practically fruitful, including some in which it shows, at the moment, the most hopeful signs of progress. If one considers any one group of investigations by itself, one may easily feel at the same time elated by the practical success obtained in the cure of some infection which but a few years ago seemed beyond the reach of treatment, and depressed by the disharmony between the results of experiment and the theoretical conceptions, hitherto available, of the nature of the chemotherapeutic process. Some of the most notable practical triumphs in this field have resulted, not from experimental investigations based on theory, but from an almost empirical trial, on human patients suffering from one type of infection, of a remedy which had experimentally shown promising results in infections of a different, and sometimes of a widely different, type. The partial success of tartar emetic in trypanosome infections might have justified a hope that it would have some effect in kala-azar, but hardly a prediction of its really remarkable efficacy in that previously intractable form of infection. Still less would it have justified expectation of the brilliant success of this same drug in infections by the schistosoma or bilharzia worm, which but recently seemed almost beyond the hope of any kind of treatment. With such instances in mind, one might, but a year or two ago, have been tempted to suggest that the attempts at theoretical investigation of the intimate mechanism of the chemotherapeutic process had contributed little to the practical achievements, and that a reasonably intelligent empiricism was still the safest guide. I do not think that the suggestion would even then have been defensible, and it would assuredly have been stultified by the results of the past few years. Patient, systematic exploration, by routes of which the initial sections were already mapped in the early days of chemotherapy, has in these recent years again led to results of major importance, both for practical therapeutics and for the theoretical basis of future advance. That the original theoretical framework begins to show itself inadequate for the expanding fabric is good reason for its reconstruction; but we may well beware of hasty and wholesale rejection, remembering that it served the early builders well. I think that it is especially encouraging to note that though in the action of almost every remedy which has proved its value in the specific cure of infection there are features which cannot be interpreted by a strict application of Ehrlich's distribution hypothesis, the discrepancies begin to show a new congruity among themselves. Repeatedly we find phenomena which point to the need of modifying the theoretical structure in the same direction. The conception of a remedy not killing the parasites immediately, but modifying their virulence, or lowering their resistance to the body's natural defences; of a remedy not acting as such, but in virtue of the formation from it in the body of some directly toxic product, either by a modification of its structure or by its union with some tissue constituent; of an affinity of the remedy for certain cells of the host's body, leading to the formation of a dépôt from which, in long persistent, never dangerous concentration, the curative substance is slowly released; all these conceptions present themselves again and again as necessary for our present rationalisation of the effects observed. It can hardly be doubted that they will potently influence the methods by which, in the immediate future, new and still better specific remedies are sought. But though our practical aim, in relation to the affinities of a remedy for the parasite and for the host's tissues, may be radically changed, the meaning of these specific affinities, so delicately adjusted to a precise molecular pattern, remains dark. Ehrlich's chemoreceptors may no longer satisfy us, but we have nothing equally definite to replace them. I have endeavoured to indicate what seem to me hopeful signs of new contacts between biochemistry and chemotherapy. There is promise, in another direction, that at least some aspects of the problem of immune specificity are being brought within the scope of strictly chemical investigation, as in the recent work of Avery and Heidelberger, on the constituent of a pneumococcus which combines with the specific precipitin. As in Ehrlich's pioneer work in chemotherapy, it can hardly be doubted that an increased understanding of the meaning of immune specificity, which but a short while ago might have seemed hopelessly beyond the range of attack by chemical weapons, will still influence ideas, and help to shape the course of further investigations on the chemotherapeutic process. As the biological complexity of the problem is realised, it becomes increasingly a matter for wonder and admiration that so much of practical value has already been achieved—the treatment of the spirochætal infections, syphilis, yaws, and relapsing fever revolutionised: leishmania infections, kala-azar and Baghdad boil, and bilharzia infections, which crippled the health of whole populations in countries such as Egypt, now made definitely curable: trypanosome infections, such as the deadly African sleeping-sickness, after years of alternating promise and disappointment, brought now at last within the range of effective treatment. And if such results have already been attained, in a period during which practice has often and inevitably outrun theory, we may well be hopeful for a future in which fuller understanding should make for more orderly progress.

GASTRIC FUNCTION BEFORE AND AFTER GASTRO-JEJUNOSTOMY.

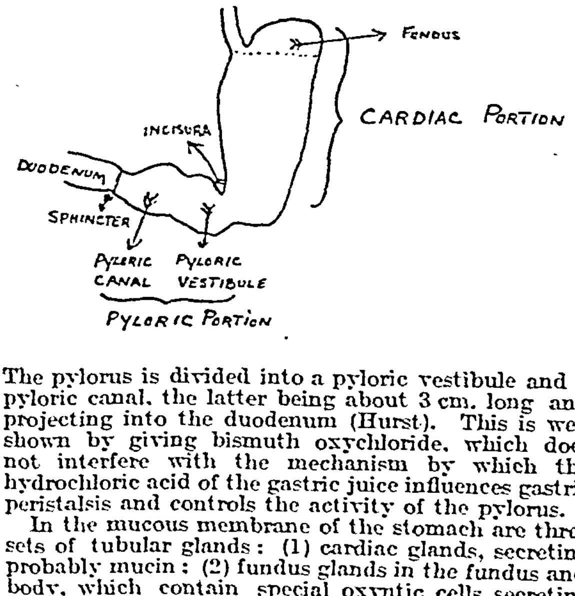
By T. G. D. BONAR, M.D., B.S. LOND., F.R.C.S. EDIN.,
RESIDENT SURGICAL OFFICER, GUY'S HOSPITAL.

IN considering the question of gastric function before and after gastro-jejunostomy—an operation done for a pathological lesion of the stomach or duodenum—normal gastric function must be mentioned.

Anatomy and Physiology.

The stomach has two main functions: (1) the secretion of gastric juice for digestive purposes; (2) peristaltic action to pass the partially digested food into the duodenum, where it is further digested by the pancreatic juice assisted by bile. If some pathological lesion of the stomach or duodenum exists, then presumably there will be some upset of these functions depending on (*a*) the position of the lesion, (*b*) the size of the lesion, (*c*) the nature of the lesion. Normally, the stomach varies in size and situation, depending on the position of the patient. Usually the greater curvature is below the umbilicus in the upright, and just above it in the horizontal posture. The fundus lies above the cardiac orifice and contains gas; the body is almost vertical, and to the left of the mid-line. The body is distinguished from the pyloric portion at the incisura angularis (Fig. 1).

FIG. 1.



The pylorus is divided into a pyloric vestibule and a pyloric canal, the latter being about 3 cm. long and projecting into the duodenum (Hurst). This is well shown by giving bismuth oxychloride, which does not interfere with the mechanism by which the hydrochloric acid of the gastric juice influences gastric peristalsis and controls the activity of the pylorus.

In the mucous membrane of the stomach are three sets of tubular glands: (1) cardiac glands, secreting probably mucin; (2) fundus glands in the fundus and body, which contain special oxyntic cells secreting hydrochloric acid; (3) pyloric glands, which probably produce a hormone causing the continued secretion of gastric juice by the fundus glands.

The secretion of gastric juice is largely under control of the central nervous system via the vagi, which serve as one of the factors to gastric secretion, the other being a chemical stimulant which enables gastric juice to be secreted as long as digestion lasts. Normally, gastric juice contains about 0·2 per cent. HCl; gastric chyme passes through the pylorus into the duodenum, and the HCl in the duodenum helps to regulate the pyloric sphincter (Von Mering). Normally, the epithelial cells of the stomach secrete an antibody—antipepsin—which prevents the stomach being digested.

Hurst has shown by X rays that when empty the upper third of the stomach contains gas. Food when swallowed causes relaxation of the stomach and the

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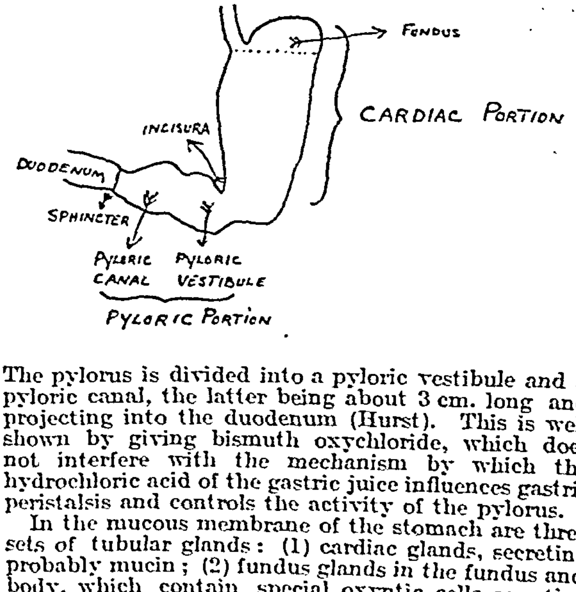
IN considering the question of gastric function before and after gastro-jejunostomy—an operation done for a pathological lesion of the stomach or duodenum—normal gastric function must be mentioned.

Anatomy and Physiology.

The stomach has two main functions: (1) the secretion of gastric juice for digestive purposes; (2) peristaltic action to pass the partially digested food into the duodenum, where it is further digested by the pancreatic juice assisted by bile. If some pathological lesion of the stomach or duodenum exists, then presumably there will be some upset of these functions depending on (*a*) the position of the lesion, (*b*) the size of the lesion, (*c*) the nature of the lesion. Normally, the stomach varies in size and situation, depending on the position of the patient. Usually the greater curvature is below the umbilicus in the upright, and just above it in the horizontal posture. The fundus lies above the cardiac orifice and contains gas; the body is almost vertical, and to the left of the mid-line. The body is distinguished from the pyloric portion at the incisura angularis (Fig. 1).

FIG. 1.



The pylorus is divided into a pyloric vestibule and a pyloric canal, the latter being about 3 cm. long and projecting into the duodenum (Hurst). This is well shown by giving bismuth oxychloride, which does not interfere with the mechanism by which the hydrochloric acid of the gastric juice influences gastric peristalsis and controls the activity of the pylorus.

In the mucous membrane of the stomach are three sets of tubular glands: (1) cardiac glands, secreting probably mucin; (2) fundus glands in the fundus and body, which contain special oxyntic cells secreting hydrochloric acid; (3) pyloric glands, which probably produce a hormone causing the continued secretion of gastric juice by the fundus glands.

The secretion of gastric juice is largely under control of the central nervous system via the vagi, which serve as one of the factors to gastric secretion, the other being a chemical stimulant which enables gastric juice to be secreted as long as digestion lasts. Normally, gastric juice contains about 0·2 per cent. HCl; gastric chyme passes through the pylorus into the duodenum, and the HCl in the duodenum helps to regulate the pyloric sphincter (Von Mering). Normally, the epithelial cells of the stomach secrete an antibody—antipepsin—which prevents the stomach being digested.

Hurst has shown by X rays that when empty the upper third of the stomach contains gas. Food when swallowed causes relaxation of the stomach and the systematic movements commence, which first begin gently, but gradually increase in intensity. Cannon showed that the pyloric end is the seat of continuous peristalsis as long as food is present, and that immediately after a small portion of food is passed into the duodenum the pylorus goes into tonic activity. Note, however, that the fundus and body do not undergo rhythmic contractions, but maintain strong tonicity so that the cardiac portion of the stomach exerts a positive pressure on the food contained. So long as food is solid the pyloric sphincter will not relax, and Cannon showed that a piece of solid food knocking against the open pyloric sphincter at once caused its closure. Therefore, for the pyloric sphincter to open, the chyme must be sufficiently acid and sufficiently thin. Associated with the absence of gastric secretion the pyloric sphincter becomes relaxed, and pancreatic juice, bile, and intestinal secretion flow back into the stomach (Boldireff).

Potential Cause of Gastric Ulcer.

From some of the observations a potential cause of gastric ulcer may be inferred. Ulcers commonly occur as pyloric ulcers. Now the mucous membrane of the stomach in the neighbourhood of the pylorus is particularly liable to injury during digestion, and the injured or inflamed cells, being no longer able to produce antipepsin, are rapidly digested and so form an early ulcer. This may cause a hypersecretion of acid by reflex stimulation, and give rise to the so-called "hunger pain," which is probably a spasmodic contraction of the pylorus brought about by the acidity. In gastric carcinoma there is a hypochlorhydria, and this is due to the destruction of the cells producing the gastric hormone with a lack of stimulation of the oxyntic cells and the formation of less acid. In the pyloric vestibule food is most intimately mixed with gastric juice, and it is here that solid food is most likely to injure the mucous membrane of the stomach and so predispose to the formation of ulcer.

Methods of Investigation.

The methods used in the investigation of patients before and after gastro-jejunostomy were the fractional test-meal and X ray examination. Rehfuss[1] was the pioneer of this method, and the technique carried out was the modification of Rehfuss's method suggested by Ryle,[2] where, for the test-meal two tablespoonfuls of oatmeal were added to a quart of water, which was boiled down to a pint and then strained—the resulting gruel being given to the patient about 9.30 A.M. after a 12-hours' fast from food and fluid. In every case an attempt was made to obtain resting juice by getting the patient to swallow the Einhorn's tube first. Every quarter of an hour up to, on an average, three hours (or until no more fluid could be extracted) a sample of the meal was removed for estimation of HCl and total acidity. The materials used for this purpose were N/10 sodium hydroxide and dimethylaminoazobenzol and phenolphthalein as indicators. Sugar and starch were tested for by Fehling's solution and iodine, and their absence was used as an indication as to when the stomach was empty. The presence of bile, mucus, or blood was also noted. In this manner the acidity in the stomach was known at any given moment, and could be compared with the acidity after operation at the same time interval. This method was considered to be more accurate and valuable in this research work than the old test-meal of tea and toast as recommended by Ewald. Ryffel,[3] comparing the two types of meal, suggested the greater value of Ewald's technique for cases of carcinoma of the stomach. Certainly with Ewald's meal mineral chlorides can be estimated, which would be extremely difficult in the case of the fractional meal, but, as will be shown later, carcinoma of the stomach is diagnosable by means of the fractional test-meal in a high percentage of cases.

All patients were submitted to an X ray examination before and after the operation, the material used being bismuth oxycarbonate made into an emulsion with water. Before operation, with a view to diagnosis of the pathological lesion present, the condition of the stomach as to size, shape, position, and tone was noted. After operation the effect of the gastro-jejunostomy on the stomach as regards size, shape, position, and tone was observed, care being taken to ascertain whether any of the opaque meal was leaving the stomach via the pylorus as well as by the stoma. It is to be noted that X ray examination may give a false impression concerning the rate of emptying of the stomach, for the heavy weight of the meal is sufficient to allow it to fall through the gastro-jejunostomy opening, especially if the patient be examined in the erect posture.

Ryle,[4] working in conjunction with Bennett, made investigations on a hundred normal students. They showed that there was a marked uniformity in gastric motility during health, and that cases with high acidity tended to empty more slowly than the average, whilst those with low acidity and especially with achlorhydria emptied more rapidly. They came to the conclusion, however, that a so-called normal curve could be given for 80 per cent. of cases, and that this could be taken as a standard (Fig. 3). This will be used later for comparison with the cases of gastro-jejunostomy that have been investigated. One other important point to notice is that, according to Bell,[5] the acidity of the gastric secretion does not tend to become less with advancing age, and the acid curve for women is usually lower than that for men.

The type of patient examined was that entering the ordinary hospital wards, and the second series of investigations were carried out about eight to nine months after the patient was discharged from hospital —i.e., about ten months after operation.

In many cases, where patients had been apparently relieved completely of symptoms, it was extraordinarily difficult to get them to submit to these further investigations, some refusing both the fractional test-meal and the X ray examination, some the fractional test-meal only. This unfortunately makes a difference in the percentage results of the cases examined. Patients who were examined were those who had gastric, pyloric, or duodenal ulcers; those with pyloric stenosis due to ulcer or carcinoma, and cases of carcinoma of the stomach. A number were also examined who had undergone an excision of the ulcer alone or with gastro-jejunostomy. In the series also are some cases of gastrectomy with anastomosis between the stomach and jejunum, and some cases of gastro-jejunal and jejunal ulcers. In all cases which were examined at operation notes were carefully made as to the site, size, and nature of the lesion, also as to the type of operation performed.

Statistics.

The ages of people suffering from ulcer lay between 21 and 50, and the average age of cases who had gastric ulcers was 35 years; pyloric ulcers, 30 years; and duodenal ulcers, 29 years. The average ages of patients who suffered from pyloric stenosis due to ulcer was 39; due to carcinoma, 52 (Fig. 2).

Altogether 100 cases were examined, with the following results: (1) Gastric ulcers, 14; (2) pyloric ulcers, with or without stenosis, 30; (3) duodenal ulcers, 33; (4) carcinoma of the stomach, 20; (5) gastro-jejunal or jejunal ulcers, 3. The number of men examined was 70, and of women 30. Men suffering from gastric ulcer numbered 6; from pyloric ulcer, 21; duodenal ulcer, 33; carcinoma, 18; whereas the corresponding figures for women were: gastric ulcer, 8; pyloric ulcer, 9; duodenal ulcer, nil; carcinoma, 2.

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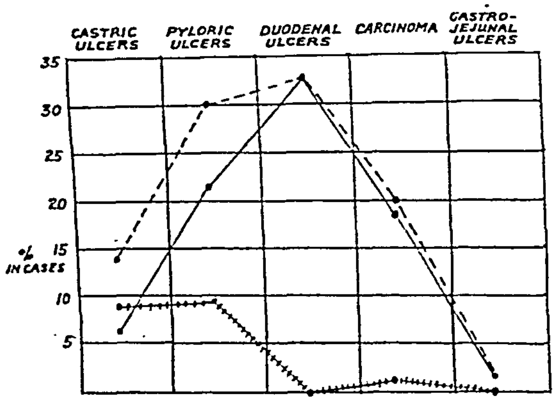
[1] American Journal of Science, 1914, ch. 147, p. 848.
[2] THE LANCET, 1920, ii., 490.
[3] THE LANCET, 1921, i., 586.
[4] Ryle and Bennett: Guy's Hospital Reports, vol. lxxi., p. 286.
[5] Bell: Guy's Hospital Reports, July, 1922, p. 306.

Fig. 3 represents the average curve as given by Ryle and Bennett (80 per cent. of normal cases) for comparison with the curves which are shown later corresponding to their respective groups before and after gastro-jejunostomy.

Group 1.—Gastric Ulcers.

An investigation into 14 cases shows that on an average this type of case presents before operation a fractional test-meal curve which resembles very much the normal. The resting juice has usually about 20 per cent. HCl (N/10 NaOH) total acidity, with little or no free HCl. The rise of acidity to a maximum takes about 2–2¼ hours, and then the acidity gradually falls. The rate of emptying of the stomach varies between 2¼ hours to 3 hours (the indication being the absence of both starch and sugar).

FIG. 2.



Curves showing corresponding percentages between men and women for the different lesions.

...... % occurr. of cases.
+ + + % occurr. in women.
——— % occurr. in men.

After gastro-jejunostomy has been performed it is to be noticed that the resting juice is on the average lower in total acidity than before operation. The total acidity reaches a maximum in about 1½–1¾ hours, and then rapidly falls. Note also that the total acidity does not reach such a high level as before operation, although this at no time reaches a hyperchlorhydria. A very important observation is that after operation there exists in 80 per cent. of cases an achlorhydria, and that the remaining 20 per cent. of cases have a marked hypochlorhydria. In all cases the stomach emptied rapidly, the average time interval being ¾ hour to 1½ hours (normal. 2¼ hours). In all cases after operation bile was present in the stomach at some time during the meal.

The X ray appearances of this group of cases are interesting. In most cases an ulcer was discovered, which filled with the bismuth meal. Most cases before operation showed that the stomach had a tendency to ptosis, was hypotonic, and that the motility was poor. After operation in 85 per cent. of cases the meal was seen to be leaving by the stoma, and in the remaining 15 per-cent. via the stoma and pylorus. In all cases the stomach was seen to be emptying rapidly.

In two cases of gastric ulcer excision of the ulcer together with a gastro-jejunostomy was performed. The after operation investigation of these cases shows that they fall into line with the above almost identically, both as regards the fractional test-meal and the X ray results. As a side issue, in two cases of gastric ulcer the stomach was opened and the ulcer cauterised. In one case a gastro-jejunostomy was also performed. Both cases agreed with the above results in the main. There was, however, to be noticed the following differences when no gastro-jejunostomy was performed: (1) the stomach did not empty as quickly as in the other cases; and (2) bile was not present at any time during the meal. In 80 per cent. of cases examined the pain had been completely relieved, and the patients had put on weight. Fæces were only examined in three cases after operation, and of these two showed no blood spectrum (? healed ulcer).

Figs. 4 and 5 show the average before and after operation results of gastric ulcers when treated by (1) gastro-jejunostomy alone; or (2) excision of the ulcer together with gastro-jejunostomy.

Group 2.—Pyloric Ulcers.

This group can be subdivided into (1) those ulcers occurring without stenosis and (2) those with stenosis. Altogether 30 cases of pyloric ulcer were investigated, of which 20 cases were placed in Group 1, and the remainder into Group 2. Of these, 21 cases occurred in men and nine in women. The percentage occurrence of pyloric ulcer is 30 per cent. in my series, of which 69 per cent. were in men and 31 per cent. in women.

(1) *Cases without Stenosis.*—On the average the test-meal showed that before operation patients had a resting juice which was slightly above normal, and after the introduction of the meal there was the usual fall of acidity in the first 15 minutes. After this period the free acid and total acidity steadily rose to a hyperchlorhydria, reaching a maximum in 1½–2¼ hours. The stomach showed a tendency to empty rather quicker than usual, the average time being two hours. After operation the resting juice was found to be slightly lower than before operation in acidity, but after the introduction of the meal the acidity rose to about the same level as before operation—i.e., a hyperchlorhydria was present. Bile was present in all samples withdrawn throughout the meal, and the stomach, as shown by the absence of starch or sugar, emptied more rapidly than before operation. X ray examination, in this type of case, showed the presence of an ulcer in the pylorus with a hypotonicity in a high percentage of cases, peristalsis was frequent, and motility was good. After operation the opaque meal was seen to be leaving by the stoma, and the stomach emptied rapidly.

(2) *Cases with Stenosis due to Ulcer.*—In these cases the fractional test-meal showed much the same type of curve as in section 1 of this group. There was the same slow rise of acid to a hyperchlorhydria. In this group starch and sugar could always be detected up to a period of 2¾ hours or more—thus showing the delay of emptying of the stomach. The stenosis caused by ulcer is shown by the hyperchlorhydria which is present (cf., later, pyloric stenosis due to carcinoma). After operation the meal showed that, as in section 1, the hyperchlorhydria still persisted, but was reached in quicker time than before operation. Bile was present throughout the meal and the stomach emptied rapidly. X ray appearances in these cases showed the degree of pyloric stenosis and the condition of the stomach proximal to the lesion. In a few cases some of the meal could be seen passing through an irregular pylorus as a streak; if the stenosis was complete then no meal was observed passing through it. Depending on the degree of stenosis present the X rays showed that the stomach was dilated in all cases, and was lower than usual in the erect posture. If the stenosis was not complete and not of long standing, the stomach was seen to be contracting violently, and the peristaltic waves were more frequent and vigorous than usual in their attempt to overcome the partial obstruction. In cases of pyloric stenosis of long period the stomach, in addition to being dilated, was hypotonic, and the peristaltic waves, if present at all, were of small amplitude and very infrequent. About a year after the operation the stomach was found not nearly so dilated, although always appearing a little large. Peristalsis

was normal, but hypotonus still existed. In all cases the meal was seen to be passing through the stoma and none via the pylorus, which still showed the deformity previously noticed (Figs. 6 and 7).

Group 3.—Duodenal Ulcers.

Of the 100 cases which have been examined 33 cases at operation were duodenal. All of these occurred in men. The fractional test-meal in these cases showed that all duodenal ulcers have a highly acid-resting juice—a marked hyperchlorhydria. In a number of the cases bile was found in varying quantities in the resting juice. After giving the meal the first sample withdrawn after 15 minutes always showed a large fall in the total acidity, which in some cases persisted up to half an hour. By one hour the acid level was always very high again, and this high level persisted throughout the remaining samples (hypersecretion). In all cases there was a rapid emptying of the stomach, as shown by the starch and sugar indicator—the stomach being free from these substances in 1¼–2 hours (the latter only occurring rarely). After operation the fractional test-meal showed that the resting juice still remained at the same high level of total acidity as before operation, but the free hydrochloric acid was reduced slightly, although marked hyperchlorhydria was still present. After the administration of the meal, in the first sample withdrawn there was the same fall of both total acidity and free hydrochloric acid. These rapidly rose to a hyperchlorhydria value about the same as before operation.

The time required to reach this value was from three-quarters of an hour to one hour, and it is to be noticed that this practically corresponds to the time interval before operation. There is the same tendency to hypersecretion both before and after operation, and the stomach empties in about the same time as before the operation. In some few cases this was a trifle quicker. Bile was present throughout the meal. The X ray appearances showed the presence of a duodenal ulcer in most cases. The stomach was found to be very hypertonic and peristaltic waves were rapidly following on one another in a few cases, but with the majority the stomach was hypotonic, peristalsis being fair and the motility indifferent. The stomach emptied rapidly. After operation the meal was seen leaving via the stoma, and very rapidly.

In cases of duodenal ulcer, when an excision of the ulcer was carried out together with a gastro-jejunostomy (in some cases also an appendicectomy) the type of curve after operation followed the same general rule mentioned above. The X ray appearances also conformed (Figs. 8 and 9).

Group 4.—Carcinoma of the Stomach.

These cases can be grouped into two: (1) where gastro-jejunostomy only has been performed, and (2) cases in which a partial excision of the stomach was carried out together with a gastro-jejunostomy. Twenty cases of carcinoma ventriculi were investigated, of which 18 cases occurred in men and two in women. Six cases only have been examined in which it was suspected that a carcinoma had followed on an ulcer of the pylorus. These cases fall into the general grouping of carcinoma ventriculi as regards investigation results.

(1) *Carcinoma with Gastro-jejunostomy Only.*—This group includes those cases where an irremovable growth was found with or without a pyloric stenosis. (All cases examined were growths of the pylorus, some of which had invaded the body of the stomach.) Fractional test-meals carried out on the same lines as before showed in most cases a low total acidity and low free acid in the resting juice. The free acid was always low throughout the meal, and in some cases a complete achylia was present. The total acidity rarely reached a high level, and in the great majority of cases rarely got above 30 per cent. HCl (N/10NaOH). Blood was found in all cases except one—in some cases visible, in others a positive guaiac test only was obtainable. The stomach showed delayed emptying, even though no marked pyloric stenosis could be shown by X ray examination (cf. leather-bottle stomach, when emptying of the stomach is rapid). In cases of pyloric stenosis there was marked delay in emptying of the stomach—in two cases the stomach not being free from starch or sugar after three hours, when the Einhorn tube was withdrawn. After operation it was found that there was complete achylia both in the resting juice and throughout the whole meal. The total acidity was low also. Bile was present throughout the whole meal and the stomach was emptying fairly rapidly (1½–2 hours). X ray examination before operation showed in most cases an appearance suggestive of carcinoma with varying degrees of pyloric stenosis. The stomach in some cases was dilated, and in most cases hypotonic. Peristalsis was present, but not at the site of the growth. Motility was fair. Peristalsis was only vigorous in one case examined—a case of partial pyloric stenosis. After operation the whole meal was observed to be leaving by the stoma, and the stomach had not recovered its tone or normal size, nor had it contracted down to a size at all approaching that in the case of stomachs with pyloric stenosis due to ulcer. Blood was still demonstrable.

(2) *Carcinoma with Partial Gastrectomy and Gastro-jejunostomy.*—In this group partial gastrectomy was performed, together with a gastro-jejunostomy. It should be noted that the type of anastomosis made no appreciable difference to the type of curve after operation—whether the operation be a partial gastrectomy with a posterior no-loop gastro-jejunostomy, or a Polya-Mayo operation where the jejunum is joined to the stomach some 15 inches from the duodeno-jejunal junction. (N.B.—In the Polya-Mayo operation the stomach empties at once.) The fractional test-meal before operation, with the X ray appearances correspond much as in pyloric ulcers with stenosis. After operation bile is present in the stomach throughout the meal. There exists a complete achylia with a very low total acidity. No blood was demonstrable. The stomach emptied very much quicker than in the cases in Group 1. Rarely was starch or sugar to be found after a quarter of an hour; in one case it persisted till half an hour. The X ray appearances showed that the stomach was small, and that the meal was leaving via the anastomosis rapidly and well (Figs. 10, 11, 12, and 13).

Gastro-jejunal and Jejunal Ulcers.

Three cases have been examined, but only in one case was a complete series of curves obtainable.

CASE 1.—Patient was admitted for a duodenal ulcer which was confirmed at operation. Before operation he gave a typical test-meal curve. Six months after operation, which had apparently relieved his condition, he was readmitted for symptoms almost identical with those for which he had been previously admitted. Test-meal curve showed a curve resembling a duodenal ulcer type. At a second operation a gastro-jejunal ulcer was found which was excised. Six months after the second operation his fractional test-meal curve still fitted into the duodenal group.

CASES 2 and 3 were only examined before their second operation was performed and six months after this operation. The operations originally were for duodenal ulcers, and a posterior gastro-jejunostomy had been performed. Both cases at both examinations showed curves which fitted into the duodenal group.

Two other cases are of interest for comparison:—

A case of duodenal ulcer, which had been definitely diagnosed by X ray and fractional test-meal, was treated medicinally for a considerable period—the patient eventually becoming relieved of his symptoms. Twelve months after the relief of symptoms he was admitted for perforation of his duodenal ulcer, which was confirmed and was sewn up. Six months after his operation a test-meal was carried out, and the curve presented corresponded, with remarkable accuracy, to his curve obtained when he had been in hospital previously for duodenal ulcer and treated medicinally. (Some have stated that after perforation an ulcer heals.)

A case of duodenal ulcer (not examined previously) was admitted for perforation. The ulcer was sewn over and a

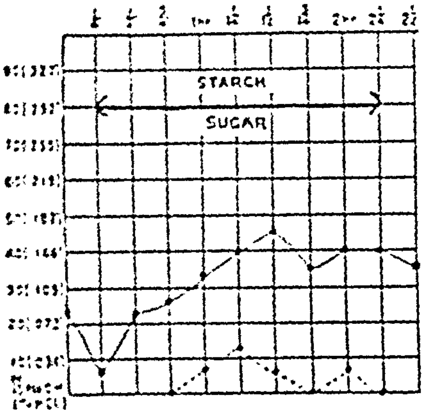


FIG. 3.—Curve representing limits of 80 per cent. of normal cases.

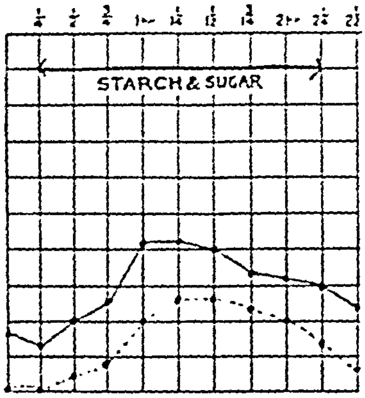


FIG. 4.—Florence A., 30 years. Gastric ulcer, Nov. 15th, 1920.

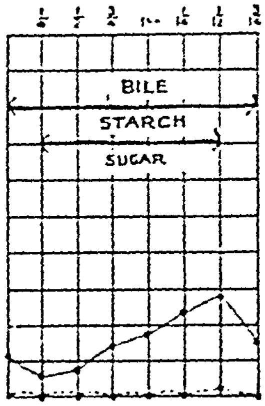


FIG. 5.—Same patient as Fig. 4, 31 years. Gastric ulcer, October, 1921.

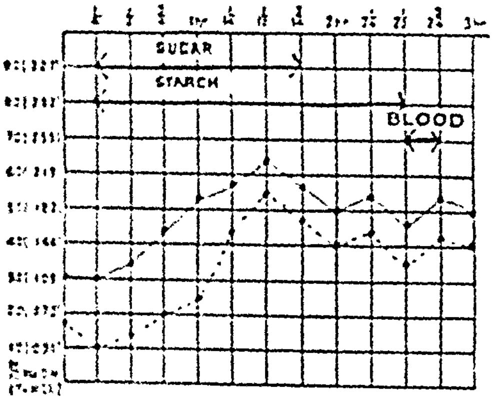


FIG. 6.—[illegible], 27 years. Pyloric ulcer, June 16th, 1920.

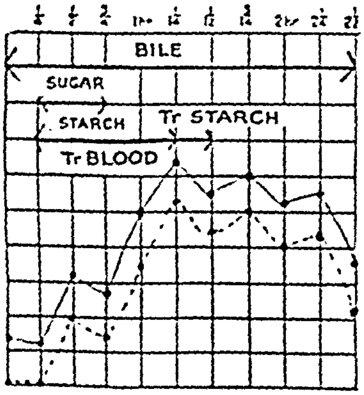


FIG. 7.—Same patient as Fig. 6, 28 years. Pyloric ulcer, April, 1921.

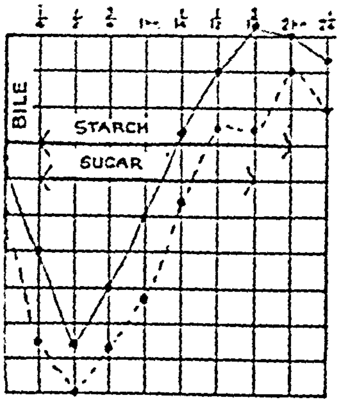


FIG. 8.—Alfred B., 46 years. Duodenal ulcer, Oct. 28th, 1921.

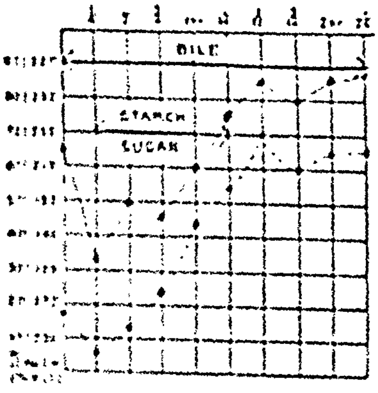


FIG. 9.—[illegible] 1921.

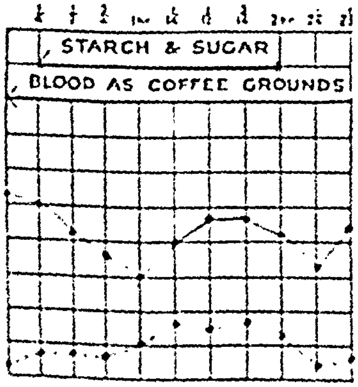


FIG. 10.—Mary H., 29 years. Carcinoma of ventriculi, March 10th, 1921.

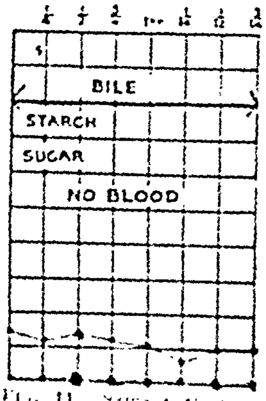


FIG. 11.—Same patient as Fig. 10, [illegible] years. Carcinoma ventriculi, Jan. [illegible], 1922. Post-mortem [illegible].

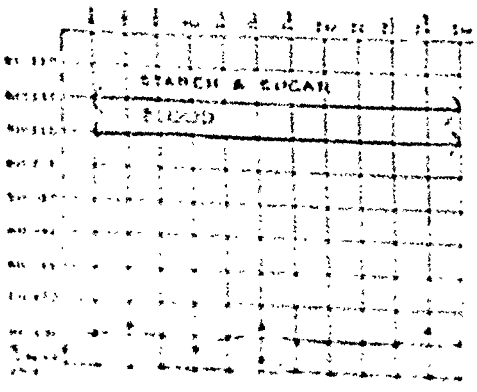


FIG. 12.—[illegible]

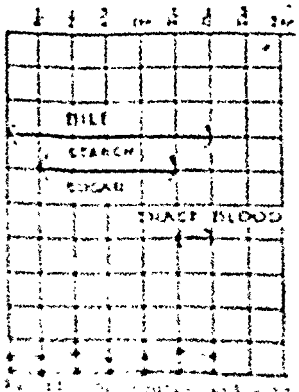


FIG. 13.—[illegible]

In Figs. 3 to 13 (Gastric Analyses) the full line indicates total acidity, and the interrupted line indicates free HCl.

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Group 4.—Carcinoma of the Stomach.

These cases can be grouped into two: (1) where gastro-jejunostomy only has been performed, and (2) cases in which a partial excision of the stomach was carried out together with a gastro-jejunostomy. Twenty cases of carcinoma ventriculi were investigated, of which 18 cases occurred in men and two in women. Six cases only have been examined in which it was suspected that a carcinoma had followed on an ulcer of the pylorus. These cases fall into the general grouping of carcinoma ventriculi as regards investigation results.

(1) *Carcinoma with Gastro-jejunostomy Only.*—This group includes those cases where an irremovable growth was found with or without a pyloric stenosis. (All cases examined were growths of the pylorus, some of which had invaded the body of the stomach.) Fractional test-meals carried out on the same lines as before showed in most cases a low total acidity and low free acid in the resting juice. The free acid was always low throughout the meal, and in some cases a complete achylia was present. The total acidity rarely reached a high level, and in the great majority of cases rarely got above 30 per cent. HCl (N/10NaOH). Blood was found in all cases except one—in some cases visible, in others a positive guaiac test only was obtainable. The stomach showed delayed emptying, even though no marked pyloric stenosis could be shown by X ray examination (cf. leather-bottle stomach, when emptying of the stomach is rapid). In cases of pyloric stenosis there was marked delay in emptying of the stomach—in two cases the stomach not being free from starch or sugar after three hours, when the Einhorn tube was withdrawn. After operation it was found that there was complete achylia both in the resting juice and throughout the whole meal. The total acidity was low also. Bile was present throughout the whole meal and the stomach was emptying fairly rapidly (1¼–2 hours). X ray examination before operation showed in most cases an appearance suggestive of carcinoma with varying degrees of pyloric stenosis. The stomach in some cases was dilated, and in most cases hypotonic. Peristalsis was present, but not at the site of the growth. Motility was fair. Peristalsis was only vigorous in one case examined—a case of partial pyloric stenosis. After operation the whole meal was observed to be leaving by the stoma, and the stomach had not recovered its tone or normal size, nor had it contracted down to a size at all approaching that in the case of stomachs with pyloric stenosis due to ulcer. Blood was still demonstrable.

(2) *Carcinoma with Partial Gastrectomy and Gastro-jejunostomy.*—In this group partial gastrectomy was performed, together with a gastro-jejunostomy. It should be noted that the type of anastomosis made no appreciable difference to the type of curve after operation—whether the operation be a partial gastrectomy with a posterior no-loop gastro-jejunostomy, or a Polya-Mayo operation where the jejunum is joined to the stomach some 15 inches from the duodeno-jejunal junction. (N.B.—In the Polya-Mayo operation the stomach empties at once.) The fractional test-meal before operation, with the X ray appearances correspond much as in pyloric ulcers with stenosis. After operation bile is present in the stomach throughout the meal. There exists a complete achylia with a very low total acidity. No blood was demonstrable. The stomach emptied very much quicker than in the cases in Group 1. Rarely was starch or sugar to be found after a quarter of an hour; in one case it persisted till half an hour. The X ray appearances showed that the stomach was small, and that the meal was leaving via the anastomosis rapidly and well (Figs. 10, 11, 12, and 13).

Gastro-jejunal and Jejunal Ulcers.

Three cases have been examined, but only in one case was a complete series of curves obtainable.

CASE 1.—Patient was admitted for a duodenal ulcer which was confirmed at operation. Before operation he gave a typical test-meal curve. Six months after operation, which had apparently relieved his condition, he was readmitted for symptoms almost identical with those for which he had been previously admitted. Test-meal curve showed a curve resembling a duodenal ulcer type. At a second operation a gastro-jejunal ulcer was found which was excised. Six months after the second operation his fractional test-meal curve still fitted into the duodenal group.

CASES 2 and 3 were only examined before their second operation was performed and six months after this operation. The operations originally were for duodenal ulcers, and a posterior gastro-jejunostomy had been performed. Both cases at both examinations showed curves which fitted into the duodenal group.

Two other cases are of interest for comparison:—

A case of duodenal ulcer, which had been definitely diagnosed by X ray and fractional test-meal, was treated medicinally for a considerable period—the patient eventually becoming relieved of his symptoms. Twelve months after the relief of symptoms he was admitted for perforation of his duodenal ulcer, which was confirmed and was sewn up. Six months after his operation a test-meal was carried out, and the curve presented corresponded, with remarkable accuracy, to his curve obtained when he had been in hospital previously for duodenal ulcer and treated medicinally. (Some have stated that after perforation an ulcer heals.)

A case of duodenal ulcer (not examined previously) was admitted for perforation. The ulcer was sewn over and a

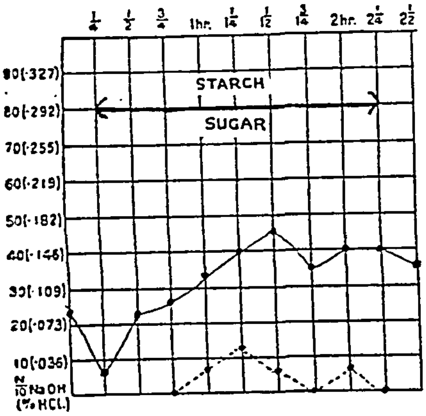

FIG. 3.—Curve representing limits of 80 per cent. of normal cases.

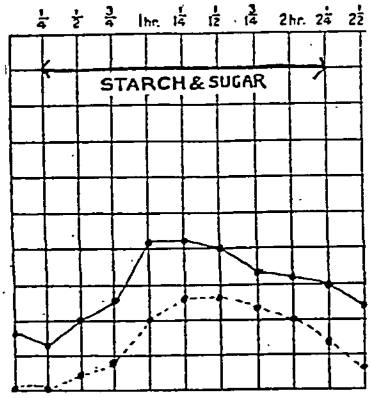

FIG. 4.—Florence A., 30 years. Gastric ulcer, Nov. 15th, 1920.

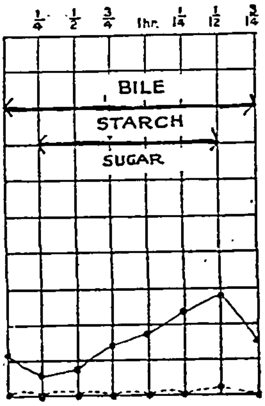

FIG. 5.—Same patient as Fig. 4, 31 years. Gastric ulcer, October, 1921.

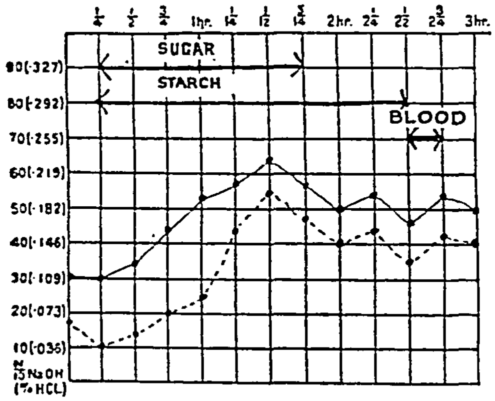

FIG. 6.—T. G., 27 years. Pyloric ulcer, June 10th, 1920.

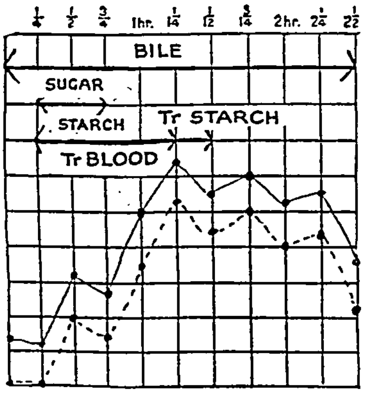

FIG. 7.—Same patient as Fig. 6, 28 years. Pyloric ulcer, April, 1921.

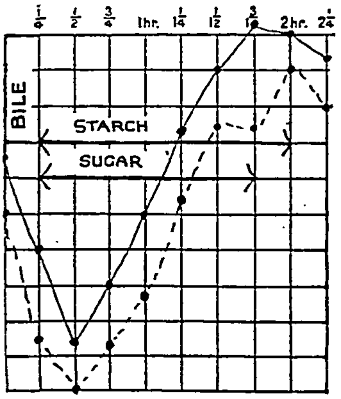

FIG. 8.—Alfred B., 46 years. Duodenal ulcer, Oct. 28th, 1920.

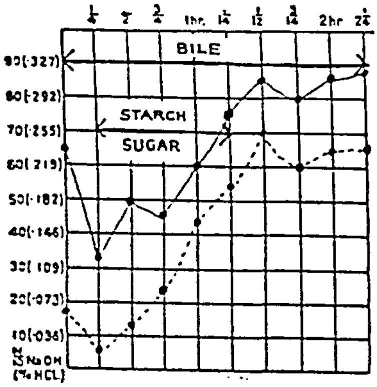

FIG. 9.—Same patient as Fig. 8, 46 years. Duodenal ulcer, September, 1921.

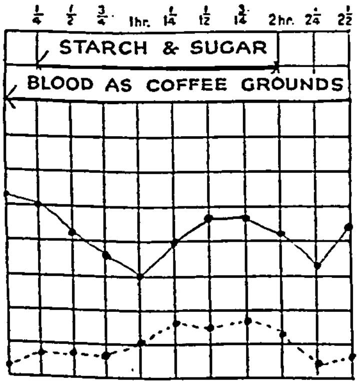

FIG. 10.—Mary H., 39 years. Carcinoma ventriculi, March 16th, 1921.

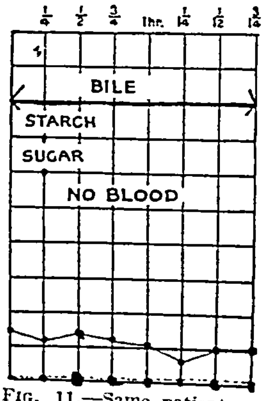

FIG. 11.—Same patient as Fig. 10, 40 years. Carcinoma ventriculi, Jan. 5th, 1922. Polya-Mayo operation.

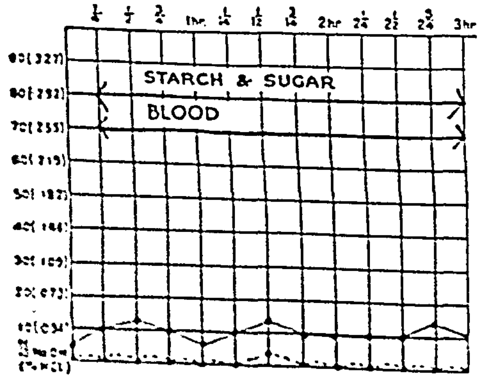

FIG. 12.—Thomas C., 52 years. Carcinoma ventriculi c. stenosis, June, 1920.

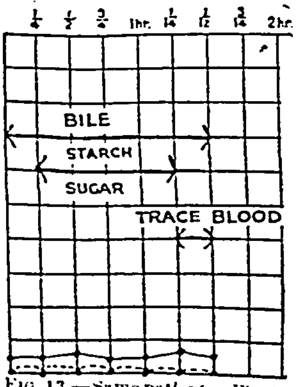

FIG. 13.—Same patient as Fig. 12, 53 years. Carcinoma ventriculi c. stenosis, December, 1920. Gastro-Jejunostomy only.

In Figs. 3 to 13 (Gastric Analysis) the bold uninterrupted line indicates acidity, and the interrupted line indicates free HCl.

posterior gastro-jejunostomy was performed. Six months after operation a curve was obtained typical of the duodenal series obtainable after operation.

Fractional Test-Meal Results.

Group 1: Gastric Ulcers.—This group gives an almost normal fractional test-meal curve before operation, and X ray shows that there is a tendency to hypotonus. After gastro-jejunostomy the free hydrochloric acid is markedly diminished (hypochlorhydria or achlorhydria); the total acidity is also diminished. The stomach empties rapidly after operation and bile is present. This result holds good whether the ulcer is excised or cauterised if a gastro-jejunostomy is performed.

Group 2: Pyloric Ulcers.—In this group there is a resting juice which is higher than normal and a steady rise of acidity to a hyperchlorhydria, which is reached in about two and a quarter hours (average). Before operation there is a hypotonicity of the stomach. After operation the resting juice was reduced slightly, but later the acidity reached almost the same level as before operation. Bile was present, and the stomach emptied more rapidly than before. Pyloric ulcers with stenosis agree with the above both before and after operation, except that before operation there is delay in the emptying of the stomach. After operation the stomach shows a tendency to recover its normal size and tone.

Group 3: Duodenal Ulcers.—These cases show a highly acid resting juice, which rapidly falls after giving the meal but as quickly rises to a hyperchlorhydria with a hypersecretion. The stomach is either hypertonic or hypotonic, and empties rapidly. After operation, whether only gastro-jejunostomy has been performed or has been combined with excision of the ulcer, a highly acid resting juice persists which, after falling on administration of the meal, rapidly rises to a hyperchlorhydria. The stomach empties rapidly and bile is present.

Gastro-jejunal and jejunal ulcers, if following on operations for duodenal ulcers, fall into this group as regards the results obtained before and after operation.

Group 4: Carcinoma of the Stomach.—These cases show low total acidity throughout the meal, and in most cases an achlorhydria. There may be a higher acidity (resembling that obtained in pyloric ulcers) present if the carcinoma is following on an ulcer. Blood is usually present, and there is delay in the emptying of the stomach (whether stenosis be present or not, except in cases of "leather-bottle" stomach). Regardless of the type of operation—excision or gastro-jejunostomy—a hypochlorhydria or achylia exists after operation. The stomach empties rapidly and bile is present—particularly in cases of gastrectomy.

This summary of results bears out what was anticipated by me on the results of a few cases published some time ago.[6]

X Ray Results.

Group 1: Gastric Ulcers.—Stomachs in this group are usually hypotonic, the peristalsis is fair, and the motility usually fairly good. After operation the meal passes out of the stomach usually via the stoma. The stomach still remains hypotonic with a fair peristaltic action.

Group 2: Pyloric Ulcers.—(1) Without stenosis: Most of these cases show hypotonic stomachs, the peristalsis is fair and the motility good. After operation the observations are as before operation, except that the meal is seen leaving via the stoma. (2) With stenosis: In these cases the stomach is hypotonic with a poor motility. The stomach is dilated and peristalsis, if the case be early, is exaggerated, but, if late, there may be no peristalsis at all, or else the peristaltic waves are irregular and of small amplitude. After operation the meal leaves via the stoma, and some dilatation still persists. The motility is still poor, and peristaltic waves are fairly frequent but of small size.

Group 3: Duodenal Ulcers.—In these cases the stomach is more often hypotonic than hypertonic. The peristaltic waves are frequent and the motility in some cases was good, in others bad. After operation the meal was leaving via the stoma, but the observations were otherwise the same as before operation.

Carcinoma Ventriculi.—(1) Cases without stenosis: Peristalsis was observable on both sides of the growth but was absent at the site of the growth. The stomach was hypotonic but the motility was good. After operation the same observations held good, except that the meal was now leaving via the stoma. (2) Cases with stenosis: This group corresponds very much with stenosis due to pyloric ulcers. The stomach is hypotonic with a poor motility. It is dilated and no peristalsis is usually seen. If waves be present they are of very small size and occur proximal to the growth. After operation the meal leaves via the stoma. In cases in which a resection of the stomach had been carried out (e.g., Polya-Mayo operation) the after X ray results showed the meal to be passing at once into the jejunum, and the stomach to be of very small size.

Conclusions.

(1) In most cases of pathological lesions of the stomach, whether ulcer or carcinoma, the stomach has a tendency to hypotonicity. The peristaltic waves do not vary in size or frequency, except in cases of pyloric stenosis, when the waves may be exaggerated if the case be early, or there may be complete absence of waves if the stenosis be almost complete. In all these cases of stenosis the motility is poor, and no waves are to be seen in the neighbourhood of the ulcer or growth. Gastro-jejunostomy allows a certain degree of recovery of the stomach to occur as regards size in cases of stenosis due to ulcer, but there is never so much recovery in cases due to carcinoma. Peristalsis remains as before.

(2) Test-meal curves show that four types of curve are usually obtainable: (*a*) Gastric ulcers tend to give a curve resembling the normal; (*b*) pyloric ulcers a curve rising to a hyperchlorhydria after a period of about two hours (in some few cases this type of curve was not obtained but a curve rather of the hypochlorhydria variety); (*c*) duodenal ulcers a curve with a highly acid resting juice and a rapidly rising hypersecretory curve; (*d*) carcinoma of the stomach a curve with a low acidity is usually present, and in some cases a complete achylia. The time of emptying of the stomach in each group agrees with X ray findings; in gastric ulcers the stomach empties in normal time, pyloric ulcers without stenosis empty slightly quicker than normally, pyloric stenosis causes delay in emptying, and in carcinoma there is usually a slightly delayed emptying.

(3) Gastro-jejunostomy, as proved both by X rays and test-meal, allows the stomach to empty more quickly than usual (except in some few cases of duodenal ulcer). The meal leaves via the stoma and in only a very few cases via the pylorus as well. Particularly is the rate of emptying increased in cases of pyloric stenosis whether due to ulcer or growth, and this is very marked in cases of partial gastrectomy with gastro-jejunostomy, where the meal passes at once into the jejunum.

(4) Gastro-jejunostomy in cases of gastric ulcer causes a reduction in the free hydrochloric acid value, but the total acidity remains much as before.

(5) Gastro-jejunostomy in cases of pyloric ulcer does not alter to any material extent the curve—a hyperchlorhydria still exists.

(6) A highly acid resting juice with a hyperchlorhydria and hypersecretion still exists in duodenal ulcer curves after gastro-jejunostomy.

(7) Carcinomata have a low free and total acidity after gastro-jejunostomy, and in cases of partial gastrectomy an achylia is found.

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[6] Bonar: THE LANCET, 1921, ii., 955.

(8) Gastro-jejunal or jejunal ulcers, if occurring after a gastro-jejunostomy for duodenal ulcer, still retain the characteristic curve of their original group—i.e., duodenal ulcer.

(9) In all cases bile gets back into the stomach during some part of or during all the test-meal.

(10) The maximum amount of upset to gastric secretion occurs in lesions in the pylorus or duodenum, ulcers giving high acidities, growths low acidities.

(11) In cases of ulcers with high acidities gastro-jejunostomy does not cause to any extent a reduction of the acidity. Its operative value therefore must be merely mechanical, constituting an attempt to rest the ulcer by short-circuiting food through the stoma. This therefore strongly points to medicinal treatment being persisted in for pyloric ulcers (where no stenosis exists) and duodenal ulcers. Pyloric stenosis is a positive indication for gastro-jejunostomy—i.e., a mechanical means of outlet for the meal must be provided. In cases of stenosis due to ulcer the acidity value is not materially altered after gastro-jejunostomy.

(12) In cases of carcinoma of the stomach gastro-jejunostomy works in much the same way as in gastric and pyloric ulcers, depending on whether a gastrectomy has been carried out at the same time or not. If a gastrectomy has been performed as well as the gastro-jejunostomy *no* free hydrochloric acid is present (cf. gastric ulcers), but in this case the total acidity is reduced as well (cf. gastric ulcers where the total acidity almost reaches the same level as before operation). In cases where only a gastro-jejunostomy has been performed the free hydrochloric acid is reduced almost to an achylia, but the total acidity may only be reduced to a small extent (particularly in cases of growth following on ulcer).

(13) Hurst[7] states "that the predisposing cause of a duodenal ulcer is a hypertonic stomach with excessive acid secretion, and whatever operation is done the patient still has the same hypertonic stomach." From these results it appears that a hypersecretion does exist in duodenal ulcers, but not necessarily a hypertonic stomach, for in the majority of my cases a hypotonic stomach was found by X rays.

(14) Gastric function is permanently upset in cases of growths of the stomach.

(15) Gastric function is permanently upset in cases of ulcers unless they heal.

(16) Gastro-jejunostomy is only indicated in cases of pyloric stenosis to act mechanically in providing an outlet for food. It relieves the pain caused by ulcer, but does not reduce acidity by allowing the entrance of bile into the stomach in cases of high acid-producing ulcers.

(17) There is a tendency for the formation of gastro-jejunal or jejunal ulcers (three cases out of 100 *in my series*) after gastro-jejunostomy in cases with high acidity.

(18) That medical treatment will be required in all cases when a gastro-jejunostomy has been performed in an attempt to reduce high acidity and to prevent gastro-jejunal ulcers.

(19) That only pyloric and duodenal ulcers cause spasm of the pylorus and therefore a resultant hypersecretion—sufficient bile never getting into the stomach to reduce the acidity to any material extent. Gastric ulcers do not cause a pyloro-spasm and therefore there is no hypersecretion. Carcinomata, by their infiltration, prevent pyloro-spasm, and therefore a low acidity is to be anticipated.

(20) Gastro-jejunostomy in pyloric and duodenal ulcers apparently does not cause a release from the pyloro-spasm, and even though bile enters the stomach in greater quantities than before operation it is not sufficient to cause a reduction in the acidity to a marked extent. In cases of carcinoma one would anticipate that more bile entering the stomach would cause a reduction in the acidity, and this is proved by the results before mentioned.

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[7] Brit. Med. Jour., 1924, i., 559.

CHANGES IN THE POLARITY OF THE FŒTUS

DURING THE LATER WEEKS OF PREGNANCY.

BY A. LOUISE McILROY, M.D., D.Sc. GLASG.,

AND

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OWING to antenatal work the subject of pelvic presentations has assumed fresh importance. The object of the present research is to investigate the frequency of the occurrence of spontaneous version of the fœtus in the uterus, and its influence upon the prognosis and treatment of obstetrical cases. Very little information has been hitherto available in the literature. To those engaged in antenatal research it is obvious that pelvic presentations occur much more frequently during the later weeks of pregnancy than has been generally supposed.

In the Obstetrical Unit pelvic presentations occurred in 1·74 per cent. of all labours of the patients who had been under observation in the antenatal clinic and in the wards. These include cases where podalic version was performed during pregnancy and at the onset of labour. Attention has also been drawn to the facility with which the fœtus tends to right itself in the majority of cases to a head presentation. It is difficult to arrive at any definite conclusion as to the cause of spontaneous version and the persistence of pelvic presentations. The fœtus, with very few exceptions, accommodates its long axis to the vertical axis of the uterus, therefore we are mainly concerned with changes from cephalic to pelvic presentations and vice versa. As the fœtus has relatively much more power of movement in the earlier weeks of pregnancy, when its position cannot be ascertained with accuracy, the present investigation is confined to the later weeks of pregnancy, more especially from the twenty-eighth week onwards.

The normal attitude of the fœtus is one of flexion which enables it to occupy the smallest space possible. The pressure from the uterus, as the fœtus grows in size, tends to maintain it in the bipolar position and in an attitude of flexion. As a head presentation is much more frequent than a pelvic presentation there must be some reason for this fact, and various theories as to its ætiology are current.

Theories as to Relative Frequency of Head Presentations.

1. *The Relationship of the Shape of the Uterus to the Fœtus in its Position of Flexion.*—The uterus in its normal pregnant condition is broader at the fundus than at the lower segment. The nearly full-time fœtus is broader at its pelvic than at its cephalic pole. Therefore the most usual position is for the pelvic pole to occupy the fundus, giving the normal cephalic presentation. The uterine walls, as pregnancy advances, tend to maintain this position by their uniform pressure upon the fœtus, or to rotate the fœtus by their contractions into the most adaptable position possible, and if either factor in this relationship be abnormal a pelvic presentation may result. This is shown by the occurrence of pelvic presentations in cases of hydrocephalus, fœtal goitre, and pre-maturity where the head is out of proportion to the body, or where changes in the shape of the uterus have occurred as the result of pathological complications.

2. *Gravity* (Matthews Duncan) is said to be a factor in maintaining the head presentation, the centre of gravity of the fœtus being in the region of the shoulders.

3. *Activity on the part of the fœtus* itself which enables it to kick itself out of the region of the pelvis and to rotate so that the head should occupy the lower zone of the uterine cavity. If the pelvic pole of the fœtus is in the fundus the fœtus has no bony resistance to kick against, and therefore it is more difficult to bring about a rotation.

Explanation of Causation and Persistence of Pelvic Presentations.

Many other theories are given for the causation and persistence of pelvic presentations, but as they posterior gastro-jejunostomy was performed. Six months after operation a curve was obtained typical of the duodenal series obtainable after operation.

Fractional Test-Meal Results.

Group 1: Gastric Ulcers.—This group gives an almost normal fractional test-meal curve before operation, and X ray shows that there is a tendency to hypotonus. After gastro-jejunostomy the free hydrochloric acid is markedly diminished (hypochlorhydria or achlorhydria); the total acidity is also diminished. The stomach empties rapidly after operation and bile is present. This result holds good whether the ulcer is excised or cauterised if a gastro-jejunostomy is performed.

Group 2: Pyloric Ulcers.—In this group there is a resting juice which is higher than normal and a steady rise of acidity to a hyperchlorhydria, which is reached in about two and a quarter hours (average). Before operation there is a hypotonicity of the stomach. After operation the resting juice was reduced slightly, but later the acidity reached almost the same level as before operation. Bile was present, and the stomach emptied more rapidly than before. Pyloric ulcers with stenosis agree with the above both before and after operation, except that before operation there is delay in the emptying of the stomach. After operation the stomach shows a tendency to recover its normal size and tone.

Group 3: Duodenal Ulcers.—These cases show a highly acid resting juice, which rapidly falls after giving the meal but as quickly rises to a hyperchlorhydria with a hypersecretion. The stomach is either hypertonic or hypotonic, and empties rapidly. After operation, whether only gastro-jejunostomy has been performed or has been combined with excision of the ulcer, a highly acid resting juice persists which, after falling on administration of the meal, rapidly rises to a hyperchlorhydria. The stomach empties rapidly and bile is present.

Gastro-jejunal and jejunal ulcers, if following on operations for duodenal ulcers, fall into this group as regards the results obtained before and after operation.

Group 4: Carcinoma of the Stomach.—These cases show low total acidity throughout the meal, and in most cases an achlorhydria. There may be a higher acidity (resembling that obtained in pyloric ulcers) present if the carcinoma is following on an ulcer. Blood is usually present, and there is delay in the emptying of the stomach (whether stenosis be present or not, except in cases of "leather-bottle" stomach). Regardless of the type of operation—excision or gastro-jejunostomy—a hypochlorhydria or achylia exists after operation. The stomach empties rapidly and bile is present—particularly in cases of gastrectomy.

This summary of results bears out what was anticipated by me on the results of a few cases published some time ago.[6]

X Ray Results.

Group 1: Gastric Ulcers.—Stomachs in this group are usually hypotonic, the peristalsis is fair, and the motility usually fairly good. After operation the meal passes out of the stomach usually via the stoma. The stomach still remains hypotonic with a fair peristaltic action.

Group 2: Pyloric Ulcers.—(1) Without stenosis: Most of these cases show hypotonic stomachs, the peristalsis is fair and the motility good. After operation the observations are as before operation, except that the meal is seen leaving via the stoma. (2) With stenosis: In these cases the stomach is hypotonic with a poor motility. The stomach is dilated and peristalsis, if the case be early, is exaggerated, but, if late, there may be no peristalsis at all, or else the peristaltic waves are irregular and of small amplitude. After operation the meal leaves via the stoma, and some dilatation still persists. The motility is still poor, and peristaltic waves are fairly frequent but of small size.

Group 3: Duodenal Ulcers.—In these cases the stomach is more often hypotonic than hypertonic. The peristaltic waves are frequent and the motility in some cases was good, in others bad. After operation the meal was leaving via the stoma, but the observations were otherwise the same as before operation.

Carcinoma Ventriculi.—(1) Cases without stenosis: Peristalsis was observable on both sides of the growth but was absent at the site of the growth. The stomach was hypotonic but the motility was good. After operation the same observations held good, except that the meal was now leaving via the stoma. (2) Cases with stenosis: This group corresponds very much with stenosis due to pyloric ulcers. The stomach is hypotonic with a poor motility. It is dilated and no peristalsis is usually seen. If waves be present they are of very small size and occur proximal to the growth. After operation the meal leaves via the stoma. In cases in which a resection of the stomach had been carried out (e.g., Polya-Mayo operation) the after X ray results showed the meal to be passing at once into the jejunum, and the stomach to be of very small size.

Conclusions.

(1) In most cases of pathological lesions of the stomach, whether ulcer or carcinoma, the stomach has a tendency to hypotonicity. The peristaltic waves do not vary in size or frequency, except in cases of pyloric stenosis, when the waves may be exaggerated if the case be early, or there may be complete absence of waves if the stenosis be almost complete. In all these cases of stenosis the motility is poor, and no waves are to be seen in the neighbourhood of the ulcer or growth. Gastro-jejunostomy allows a certain degree of recovery of the stomach to occur as regards size in cases of stenosis due to ulcer, but there is never so much recovery in cases due to carcinoma. Peristalsis remains as before.

(2) Test-meal curves show that four types of curve are usually obtainable: (*a*) Gastric ulcers tend to give a curve resembling the normal; (*b*) pyloric ulcers a curve rising to a hyperchlorhydria after a period of about two hours (in some few cases this type of curve was not obtained but a curve rather of the hypochlorhydria variety); (*c*) duodenal ulcers a curve with a highly acid resting juice and a rapidly rising hypersecretory curve; (*d*) carcinoma of the stomach a curve with a low acidity is usually present, and in some cases a complete achylia. The time of emptying of the stomach in each group agrees with X ray findings; in gastric ulcers the stomach empties in normal time, pyloric ulcers without stenosis empty slightly quicker than normally, pyloric stenosis causes delay in emptying, and in carcinoma there is usually a slightly delayed emptying.

(3) Gastro-jejunostomy, as proved both by X rays and test-meal, allows the stomach to empty more quickly than usual (except in some few cases of duodenal ulcer). The meal leaves via the stoma and in only a very few cases via the pylorus as well. Particularly is the rate of emptying increased in cases of pyloric stenosis whether due to ulcer or growth, and this is very marked in cases of partial gastrectomy with gastro-jejunostomy, where the meal passes at once into the jejunum.

(4) Gastro-jejunostomy in cases of gastric ulcer causes a reduction in the free hydrochloric acid value, but the total acidity remains much as before.

(5) Gastro-jejunostomy in cases of pyloric ulcer does not alter to any material extent the curve—a hyperchlorhydria still exists.

(6) A highly acid resting juice with a hyperchlorhydria and hypersecretion still exists in duodenal ulcer curves after gastro-jejunostomy.

(7) Carcinomata have a low free and total acidity after gastro-jejunostomy, and in cases of partial gastrectomy an achylia is found.

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[6] Bonar: THE LANCET, 1921, ii., 955.

(8) Gastro-jejunal or jejunal ulcers, if occurring after a gastro-jejunostomy for duodenal ulcer, still retain the characteristic curve of their original group—i.e., duodenal ulcer.

(9) In all cases bile gets back into the stomach during some part of or during all the test-meal.

(10) The maximum amount of upset to gastric secretion occurs in lesions in the pylorus or duodenum, *ulcers giving high acidities, growths low acidities.*

(11) In cases of ulcers with high acidities gastro-jejunostomy does not cause to any extent a reduction of the acidity. Its operative value therefore must be merely mechanical, constituting an attempt to rest the ulcer by short-circuiting food through the stoma. This therefore strongly points to medicinal treatment being persisted in for pyloric ulcers (where no stenosis exists) and duodenal ulcers. *Pyloric stenosis is a positive indication for gastro-jejunostomy*—i.e., a mechanical means of outlet for the meal must be provided. In cases of stenosis due to ulcer the acidity value is not materially altered after gastro-jejunostomy.

(12) In cases of carcinoma of the stomach gastro-jejunostomy works in much the same way as in gastric and pyloric ulcers, depending on whether a gastrectomy has been carried out at the same time or not. If a gastrectomy has been performed as well as the gastro-jejunostomy no free hydrochloric acid is present (cf. gastric ulcers), but in this case the total acidity is reduced as well (cf. gastric ulcers where the total acidity almost reaches the same level as before operation). In cases where only a gastro-jejunostomy has been performed the free hydrochloric acid is reduced almost to an achylia, but the total acidity may only be reduced to a small extent (particularly in cases of growth following on ulcer).

(13) Hurst[7] states "that the *predisposing cause of a duodenal ulcer is a hypertonic stomach with excessive acid secretion, and whatever operation is done the patient still has the same hypertonic stomach.*" From these results it appears that a hypersecretion does exist in duodenal ulcers, but not necessarily a hypertonic stomach, for in the majority of my cases a hypotonic stomach was found by X rays.

(14) Gastric function is permanently upset in cases of growths of the stomach.

(15) Gastric function is permanently upset in cases of ulcers unless they heal.

(16) Gastro-jejunostomy is only indicated in cases of pyloric stenosis to act mechanically in providing an outlet for food. It relieves the pain caused by ulcer, but does not reduce acidity by allowing the entrance of bile into the stomach in cases of high acid-producing ulcers.

(17) There is a tendency for the formation of gastro-jejunal or jejunal ulcers (three cases out of 100 in my series) after gastro-jejunostomy in cases with high acidity.

(18) That medical treatment will be required in all cases when a gastro-jejunostomy has been performed in an attempt to reduce high acidity and to prevent gastro-jejunal ulcers.

(19) That only pyloric and duodenal ulcers cause spasm of the pylorus and therefore a resultant hypersecretion—sufficient bile never getting into the stomach to reduce the acidity to any material extent. Gastric ulcers do not cause a pyloro-spasm and therefore there is no hypersecretion. Carcinomata, by their infiltration, prevent pyloro-spasm, and therefore a low acidity is to be anticipated.

(20) Gastro-jejunostomy in pyloric and duodenal ulcers apparently does not cause a release from the pyloro-spasm, and even though bile enters the stomach in greater quantities than before operation it is not sufficient to cause a reduction in the acidity to a marked extent. In cases of carcinoma one would anticipate that more bile entering the stomach would cause a reduction in the acidity, and this is proved by the results before mentioned.

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[7] Brit. Med. Jour., 1921, i., 559.

CHANGES IN THE POLARITY OF THE FŒTUS

DURING THE LATER WEEKS OF PREGNANCY.

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OWING to antenatal work the subject of pelvic presentations has assumed fresh importance. The object of the present research is to investigate the frequency of the occurrence of spontaneous version of the fœtus in the uterus, and its influence upon the prognosis and treatment of obstetrical cases. Very little information has been hitherto available in the literature. To those engaged in antenatal research it is obvious that pelvic presentations occur much more frequently during the later weeks of pregnancy than has been generally supposed.

In the Obstetrical Unit pelvic presentations occurred in 1·74 per cent. of all labours of the patients who had been under observation in the antenatal clinic and in the wards. These include cases where podalic version was performed during pregnancy and at the onset of labour. Attention has also been drawn to the facility with which the fœtus tends to right itself in the majority of cases to a head presentation. It is difficult to arrive at any definite conclusion as to the cause of spontaneous version and the persistence of pelvic presentations. The fœtus, with very few exceptions, accommodates its long axis to the vertical axis of the uterus, therefore we are mainly concerned with changes from cephalic to pelvic presentations and vice versa. As the fœtus has relatively much more power of movement in the earlier weeks of pregnancy, when its position cannot be ascertained with accuracy, the present investigation is confined to the later weeks of pregnancy, more especially from the twenty-eighth week onwards.

The normal attitude of the fœtus is one of flexion which enables it to occupy the smallest space possible. The pressure from the uterus, as the fœtus grows in size, tends to maintain it in the bipolar position and in an attitude of flexion. As a head presentation is much more frequent than a pelvic presentation there must be some reason for this fact, and various theories as to its ætiology are current.

Theories as to Relative Frequency of Head Presentations.

1. *The Relationship of the Shape of the Uterus to the Fœtus in its Position of Flexion.*—The uterus in its normal pregnant condition is broader at the fundus than at the lower segment. The nearly full-time fœtus is broader at its pelvic than at its cephalic pole. Therefore the most usual position is for the pelvic pole to occupy the fundus, giving the normal cephalic presentation. The uterine walls, as pregnancy advances, tend to maintain this position by their uniform pressure upon the fœtus, or to rotate the fœtus by their contractions into the most adaptable position possible, and *if either factor in this relationship be abnormal a pelvic presentation may result.* This is shown by the occurrence of pelvic presentations in cases of hydrocephalus, fœtal goitre, and pre-maturity where the head is out of proportion to the body, or where changes in the shape of the uterus have occurred as the result of pathological complications.

2. *Gravity* (Matthews Duncan) is said to be a factor in maintaining the head presentation, the centre of gravity of the fœtus being in the region of the shoulders.

3. *Activity on the part of the fœtus* itself which enables it to kick itself out of the region of the pelvis and to rotate so that the head should occupy the lower zone of the uterine cavity. If the pelvic pole of the fœtus is in the fundus the fœtus has no bony resistance to kick against, and therefore it is more difficult to bring about a rotation.

Explanation of Causation and Persistence of Pelvic Presentations.

Many other theories are given for the causation and persistence of pelvic presentations, but as they concern more or less the ætiology of pelvic deliveries, they cannot be adopted in many cases of pelvic presentation which occur during pregnancy, and which are more or less transient.

Of these theories the following may be mentioned:

1. *Prematurity.*—In early pregnancy the fœtal head is larger in proportion to the fœtal pelvis than when nearer term, therefore it may adapt itself more easily to the fundus. The frequency of pelvic presentations at delivery is greater in premature cases than at term (1 in 30 as compared with 1 in 62 at term, Pinard). For the purpose of the present investigation 1900 cases were taken which had been followed through the antenatal clinic and completed delivery in the wards. These cases were under the care of the unit senior staff, which included Dr. Gertrude Dearnley, Dr. Catherine Houlton, and Dr. Edith Hall.

Pelvic presentations were found during pregnancy at one time or another in 600 cases. Of these, 33 were delivered as pelvic presentations. In 18 out of these 33 the fœtus was premature. It must be taken into consideration, however, that pregnancy was interrupted or that premature labour occurred in a number of cases, owing to pathological conditions of the mother.

Of all cases investigated where the pelvic pole had presented during pregnancy 25 were delivered prematurely, of which 16 were primigravidæ and nine multiparæ. They were delivered with the head in advance, after the performance of version or the occurrence of spontaneous version.

It would seem as if prematurity were not the main or primary factor in the causation of pelvic polar presentations, but rather that labour had occurred or was induced at a stage when the fœtus was occupying an inverted position in the uterus. If nothing interferes with its continued occupation of the uterus the fœtus will, in the majority of cases, right itself some weeks before labour is due.

2. *Multiparity*, because of the roomy cavity and lax uterine walls, is said to favour the persistence of pelvic presentations. Winckel found 1 in 80 cases of primigravidæ and 1 in 23 cases of multiparæ. Of the total 600 cases investigated during pregnancy we found that 340 were primigravidæ and 147 in their second pregnancy, and the remaining numbers diminished as the number of previous pregnancies increased. In the pelvic presentation cases at delivery the primigravidæ numbered 19 and the multiparæ 14.

The statistics are open to error in the matter of multiparity, as the majority of the cases attending the clinic are primigravidæ, and the next in frequency are in their second pregnancy.

If the uterus is lax and its cavity enlarged it should tend to facilitate the effect of gravity to some extent in bringing about a head presentation. Once a head presentation is established, however, the pressure of the uterus on the fœtus may not be sufficient to keep it in position. In the pelvic deliveries, although the primigravidæ predominated in number, eight of these were premature. This fact, as already stated, complicates the investigation of possible causes.

3. *Obstruction at the pelvic inlet by tumours, placenta prævia, &c.*, may influence pelvic deliveries, but it cannot be said to affect the spontaneous version of the fœtus during pregnancy. Three cases of fibroid tumours occurred among the 600 cases, and in each instance delivery took place by the cephalic pole. Spontaneous version occurred several weeks before the onset of labour. There were 8 cases of placenta prævia (primigravidæ 3, multiparæ 5), 4 being delivered with the head presentation.

Placenta Prævia (Eight Cases).

Cephalic Pole Delivery.

Spontaneous version.	Week.	
1 case	30th	Delivery by Cæsarean section.
1 ,, ...	37th	
1 ,, ...	26th	Delivery normal.
1 ,, ...	30th	

Pelvic Pole Delivery.

Version.	Week.	
1 case was performed	38th	Delivery by Cæsarean section.
1 ,, ,, ,,	26th	Delivery as footling.
1 ,, ,, ,,	32nd	
1 ,, ,, ,,	28th	

4. The *age of the mother* had no influence upon spontaneous version. The statistics corresponded to the average reproductive age. Five primigravidæ were between 36 and 41 years. None of the others was over 33

5. The *sex of the fœtus* corresponded with the average cephalic rate and had no influence upon spontaneous version.

6. A minor degree of *pelvic contraction* was observed in a considerable number of cases, but did not seem to bear much relationship to the polar rotation of the fœtus, nor did it much influence pelvic deliveries, as out of 33 pelvic polar deliveries only two cases of pelvic contraction were observed. Every case was carefully measured at the first examination. The proportion of pelvic contraction cases was about the same as that found in those in which spontaneous version did not take place.

It is possible that pelvic contraction may favour obliquity of the uterine and fœtal axis, but further research is being carried out with regard to this.

7. *Twins.*—Eleven cases of twins were investigated but not included with the other cases. In five cases both fœtuses were born head first; in five cases one fœtus was born head first, and the other breech first, and in one case both fœtuses were born breech first. In one of these labour occurred before term. There was one case of triplets where labour was premature, two of the fœtuses were born head first, and one breech first. It would seem that for better adaptation of two fœtuses in the uterus less room is taken up when one presents by the head and the other by the breech.

8. *Hydramnios* was present in four cases of twin pregnancy, but only in four of the single pregnancy cases. It is very difficult to estimate with any degree of accuracy the amount of liquor amnii in any given case.

9. *Deformities of the fœtus* obviously tend to change its normal presentation. In one case only was hydrocephalus observed, and in one spina bifida.

10. *Other factors* were investigated with regard to their influence upon polar rotation of the fœtus, but gave no evidence of their importance. These were *length* and *weight* of the fœtus, and *length of the umbilical cord.*

Before discussing the influence of these factors, it will be well to give some account of the behaviour of the fœtus with regard to polar rotation in the later weeks of pregnancy.

Spontaneous version from the pelvic to the cephalic pole occurred in 451 cases. (Table I.)

TABLE I.—*Spontaneous Version from Pelvic to Cephalic Pole.*

Weeks.	Cases.	Weeks.	Cases.	Weeks.	Cases.
Between—		Between—		Between—	
20–24	6	28–32	47	34–36	52
22–32	7	28–34	57	36–38	11
24–30	45	30–34	61	38–40	10
26–32	45	32–34	55		
28–30	29	32–36	26		451

Spontaneous version occurs most frequently between the thirtieth and thirty-sixth weeks, as a rule before the thirty-sixth week, and most frequently between the thirty-second and thirty-fourth weeks.

Version was successfully performed in 69 cases, the greatest number occurring between the thirty-second and thirty-fourth weeks. (Table II.)

TABLE II.—*Version Successfully Performed Once in Pelvic Presentations.*

Week.	Primi-gravidæ.	Multi-paræ.	Total	Week.	Primi-gravidæ.	Multi-paræ.	Total
26th	0	1	1	35th	2	2	4
28th	1	0	1	36th	5	6	11
30th	4	3	7	38th	3	3	6
32nd	8	7	15	40th	1	2	3
34th	6	15	21				

Anæsthetics were given in four of these cases. The infants were all born alive. Spontaneous rotation to a pelvic presentation occurred again in five cases, but the fœtus righted itself before onset of labour.

Attempts at version failed in 27 cases, 17 of which were primigravidæ and 10 multiparæ. Spontaneous version occurred subsequently in 13 cases. Version was again attempted and successfully performed in 8 cases. Failure was found to be due to extended legs in 6 of the cases, anæsthetics were given in 11 cases in which the legs were extended, but version was successful in only 5. Anæsthesia, therefore, is of little help in rotating the fœtus if the legs and back are extended.

Transverse Presentations.

Twenty-four cases were diagnosed as transverse, of which 8 were primigravidæ and 16 multiparæ. Spontaneous version occurred in 19 cases, in the majority between the thirtieth and thirty-fourth weeks, and in 2 cases at the onset of labour. Version was performed in 5 cases, 1 at the thirtieth week, 1 at the thirty-second week, 1 at the thirty-fourth week, and 2 at the thirty-sixth week. In one of the latter spontaneous version took place to the transverse, and spontaneous version to head presentation. All 24 cases ended in vertex deliveries except one, which was a case of hydramnios with pelvic delivery. Three cases showed a minor degree of pelvic contraction, 1 being delivered by Cæsarean section and 2 by induction of labour.

Factors Influencing Spontaneous Version Rotation.

Influence of Length of the Fœtus on Spontaneous Version Rotation.—The fœtuses were measured at birth, and the average lengths were found to correspond closely with those of other cases where the cephalic presentation remained throughout pregnancy. The average lengths were divided into four main groups which gave in order of frequency 20 inches, 21 inches, 19 inches, and 22 inches. The longest fœtus measured was 25 inches. It was found that the length of the fœtus had little or no influence upon failure to perform version.

In one case of transverse presentation version was easily performed at the thirty-sixth week, the fœtus at birth being 24 inches in length. Version failed in one case at the thirty-third week, and delivery occurred at term by the pelvic pole. The length of the fœtus was 18 inches.

In cases where failure to perform version occurred the fœtus was found in every case to be of average length at birth. In cases where version was easy or occurred spontaneously the fœtus was up to the average length or longer. In some cases in which attempts at version failed, spontaneous version occurred a few weeks later when the fœtus was longer. We therefore came to the conclusion that, contrary to our expectations, the length of the fœtus has little if any influence upon its polar rotation.

Weight of the Fœtus.—The infants born at term were of average standard weight. The most frequent weight found was 6 lb. 12 oz.; the next was 7 lb. 12 oz.; the next was 7 lb. 4 oz.; and the next was 7 lb. 8 oz.

Spontaneous version occurred in two cases at the thirty-eighth week: in the first case the weight was 10 lb. at birth, in the second the weight was 9 lb. 12 oz. at birth; one case at the thirty-second week, weight 9 lb. 6 oz. at birth. Version was performed easily in one case at the thirtieth week, weight at birth 9 lb. 8 oz. In one case version was performed at the thirty-fourth and again at the thirty-sixth week, weight 9 lb. 9 oz. These weights were well above the average and might be expected to influence version. In 12 cases in which attempts at version failed, the weight at birth was average or below average. Spontaneous version occurred later in eight of these cases and pelvic delivery in four cases.

Length of the Umbilical Cord.—A short cord has no influence upon the rotation of the fœtus or on failure to perform version. Spontaneous version occurred in 1 case of a cord 10 inches, 2 cases of 12 inches, 1 case of 13 inches, and 9 cases of 14 inches. Version was performed easily in 1 case of a cord 10 inches, 2 cases of 12 inches, 1 case of 13 inches, and 1 case of 14 inches, and 1 case of 15 inches. Spontaneous version or version was performed in all short cord cases. When version failed the cords were of normal length. In one case of a cord of 12 inches attempts at version were discontinued at the thirty-sixth week, as the patient was faint. Spontaneous version took place at the thirty-eighth week. As in cephalic presentations, long cords have a greater tendency to loop round the neck or body. The occurrence of loops in the cord was not more frequent than in the control cases.

Pelvic Polar Presentations.

Thirty-three cases were delivered as pelvic presentations. Of these, 11 were primigravidæ at term and 4 multiparæ at term. 18 were premature, of which 8 were primiparæ and 10 multiparæ. Appended are details of the cases. (Table III.)

In the cases at term the pelvic presentation was due in 7 cases to extended legs, version having failed in 3 cases, and 2 were not diagnosed before delivery. The causes of the remaining cases could not be ascertained, some were not seen more than once or twice during pregnancy, and in others the fœtus again rotated after version had been successfully performed. In the premature 8 were due to placenta prævia or toxæmia, 3 to general patho-

TABLE III.—*Pelvic Polar Presentations at Delivery.*

A.—*Primigravidæ at Term.*

Case.	First diagnosed.	Management.	Cause.	Results to child.
1	Week— 37th.	Version not performed as uterus very sensitive.	Uk.	Alive. 7 lb. 10 oz.
2	28th.	Not seen later.	Uk.	Alive. 7 lb. 10 oz.
3	Vertex 32nd. 34th.	Not seen later.	E.L.	Alive. 6 lb. 12 oz.
4	30th.	Version failed at 38th week under anæsthesia.	Uk.	Alive. 6 lb. 2 oz.
5	Vertex 32nd–36th. 30th.	Diagnosis doubtful at 36th week.	E.L.	Alive. 6 lb. 12 oz.
6	36th.	Not seen later.	Uk.	Alive. 6 lb. 12 oz.
7	32nd.	Version failed at 36th week.	E.L.	Alive. 5 lb. 11 oz.
8	34th.	Version 34th week, again pelvic pole at 40th week. Version failed under anæsthesia.	Uk.	Prolapsed cord; stillbirth. 8 lb. Cord length 18 in.
9	28th.	Version failed 34th, 36th, 38th week (under anæsthesia.	E.L.	Stillbirth.
10	32nd.	Diagnosed as vertex later.	E.L.	Alive. 6 lb. 13 oz.
11	28th.	Diagnosed as vertex at 39th week.	E.L.	Alive. 7 lb. 12 oz.

B.—*Multiparæ at Term.*

Case.	First diagnosed.	Management.	Cause.	Results to child.
1	38th.	Version failed.	E.L.	Alive. 6¼ lb.
2	32nd.	Version 34th week, spontaneous version again 38th week followed by spont. version to pelvic pole.	Uk.	Alive. 8 lb. 6 oz.
3	33rd.	Diagnosed as vertex later.	Uk.	Alive. 5 lb. 6 oz.
4	34th.	—	Uk.	Alive. 6 lb. 12 oz.

Uk. = Unknown. E.L. = Extended legs.

C.—*Primigravidæ (Premature).*

Case.	First diagnosed.	Management and complications.	Result.
1	30th.	Version failed under anæsthesia at 36th week. Footling presentation at labour 38th.	Child alive. 5 lb. 8 oz.
2	30th.	Toxæmia severe with œdema, version not attempted as fear of injury to placenta 38th week.	Dead. Hydrocephalus; spina bifida.
3	34th.	A.P.H. 34th week.	Stillbirth.
4	32nd.	Version failed 35th week with anæsthesia, cause unknown, patient syphilitic.	Stillbirth.
5	30th.	Version 30th week, not seen again until in labour at 36th week, extended legs.	Alive. 4 lb. 1 oz.
6	36th.	Version failed 37th week, extended legs 38th.	Alive. 5 lb. 12¼ oz.
7	33rd.	38th week prolapsed cord, small pelvic Cæsarean section.	Alive. 4 lb. 13 oz.
8	38th.	Version at 38th week, central placenta prævia, Cæsarean section.	Alive.

D.—*Multiparæ (Premature).*

Case.	First diagnosed.	Management and complications.	Result.
1	28th.	Toxæmia, A.P.H. 28th week, sudden onset of labour, extended legs, cord prolapsed.	Lived 4 hours.
2	28th.	Cardiac disease, 36th week.	Alive. 5 lb. 4¼ oz.
3	26th.	27th week, cause unknown.	Stillbirth.
4	26th.	Placenta prævia, hæmorrhage, 26th week.	Stillbirth.
5	30th.	33rd week, cause unknown.	Did not survive.
6	28th.	Version at 32nd week, again rotated version failed at 36th week and labour began.	Alive. Spina bifida. 6 lb. 15 oz.
7	32nd.	A.P.H., central placenta prævia, induction of labour 32nd week.	Stillbirth.
8	32nd.	Placenta prævia, A.P.H., version and foot brought down.	Lived 14 hrs. Mother died of broncho-pneumonia.
9	—	25th week induction, pulmonary hæmorrhage.	Stillbirth.
10	—	Placenta prævia, version, and delivery 28th week.	Lived 2 days.

logical conditions, and 1 to contracted pelvis with prolapsed cord in which Cæsarean section was performed. In 3 cases labour followed within a few days after version had been attempted or performed.

Seven *fœtal deaths* occurred in the cases of head presentations due to fœtal distress and application of forceps at term. In all of these spontaneous version had taken place some weeks before term. The other deaths were due to early onset of labour where the fœtus was not viable.

Extended Legs.—The chief factor which influences the persistence of pelvic presentations is extended legs, where the lower limbs act as a brace to prevent the natural flexion of the spine taking place. This is one of the most obstinate conditions with which we have to deal, and the most common cause of failure to perform version. X ray examinations have demonstrated the extension of the lower limbs and back. If the spine of the fœtus is curved and the limbs flexed rotation easily takes place. Any interference with this attitude may influence the persistence of pelvic presentations. In some cases it cannot be overcome by anæsthesia, which to a certain extent renders the performance of version easy by relaxing the resistance of the abdominal and uterine walls. Although manipulations under anæsthesia cannot in every case alter the abnormal attitude of the fœtus, it may alter later spontaneously to a head presentation.

Diagnosis of Pelvic Presentations during Pregnancy.

Special attention must be paid to the mobility, roundness, and hardness of the head in the fundus of the uterus, and to the groove of the neck together with the absence of this pole from the lower uterine zone. It must be remembered, however, that in cases of extended legs the pelvic pole is compact and hard, and easily mistaken for the cephalic pole, more especially when it is deeply engaged in the cavity of the maternal pelvis.

We did not find the localisation of fœtal heart sounds round the umbilicus to be a reliable guide. The diagnosis in a large number of the cases was confirmed or contradicted by X ray examinations, and accurate information as to the attitude of the fœtus was obtained, more especially in cases of persistent pelvic presentations in which the fœtal spine was seen to be extended, and attempts at version failed, owing to the rigid condition of the spine and lower limbs.

We are much indebted to Dr. Ulysses Williams and Sister Cooper for their keen enthusiasm and help in procuring skiagraphs. So far no harmful results to the fœtus have been observed as a result of exposure to X rays.

The weeks in which spontaneous version occurred were charted as near as possible to a particular week, and although no doubt errors and mistakes in diagnosis have occurred the observations have been carried out with the expenditure of much time and care on the part of the staff. There are gaps in the diagnosis in some cases owing to the patients failing to attend at regular intervals for abdominal examination. Calculations as to the date of pregnancy were based on the menstrual period as being, of all the unreliable methods, the most reliable. Confirmation was gained by estimating the size and height of the uterus, and the relation of the presenting part to the maternal pelvis.

Treatment of Pelvic Presentations during Pregnancy.

Since spontaneous version occurs so frequently it is as well to leave the fœtus alone to adjust itself in the earlier weeks, and as spontaneous version as a rule takes place between the twenty-eighth and thirty-fourth weeks no attempt at interference should be made before the latter date. If version is easily performed it would in all probability have taken place spontaneously, and experience has shown that in some cases of failure spontaneous version has occurred subsequently. If the pelvic presentation persists in a primigravida after the thirty-sixth week version is advisable, as it may prevent complications in labour, or failure may at least give an indication of difficulties ahead. In multiparæ version is seldom indicated, as in a number of cases where it has been performed the fœtus has again rotated on its axis. In cases of elderly primigravidæ in which version has failed owing to extension of the legs, delivery by Cæsarean section should be considered, as the results to the fœtus are otherwise unsatisfactory.

The chief dangers of version are the bringing on of premature labour by sensitising the uterus, strangulation of the cord, and separation of the placenta by undue manipulation with consequent formation of retro-placental hæmatoma and death of the fœtus.

Summary.

This investigation has not clearly disclosed the factors which influence pelvic presentations. Deformities of the fœtus can be eliminated to a large extent as only one case of hydrocephalus was observed. The length and weight of the fœtus, or the length of the umbilical cord, have been shown to be of little value as determinant factors in spontaneous version or in the prevention of version. Excessive liquor amnii may be a factor, but, as the percentage of cases was small, much importance cannot be given to it. Twins, for their better accommodation, have a tendency for one fœtus to occupy the lower portion of the uterus with its pelvic pole. The occurrence of pelvic deliveries is frequently due to the premature onset of labour. Deformities of the pelvis are not a marked factor as only two were found in 33 pelvic deliveries. Other cases of pelvic contraction corresponded in frequency with those found in the control cases. There were 21 cases of induction of labour, mainly for fœtal and pelvic disproportion or for cardiac and pulmonary diseases, 8 in primigravidæ and 13 in multiparæ. With two exceptions the disproportion cases resulted in head deliveries.

It was observed that in a considerable number of cases the occiput failed to rotate to the front early in labour, and many of these required manual rotation. Globularity in the shape of the uterus has been given as a cause of pelvic presentations, but our investigations furnish no new information regarding this hypothesis. It is difficult to estimate the degree of globularity of the uterus during pregnancy with any flexed standard; in pelvic polar presentations the effect is difficult to separate from the cause. In cases of extended legs there can be little globularity present. The influence of placenta prævia is difficult to estimate, owing to the frequency of interrupted pregnancies and the complication of treatment by version to bring about a footling presentation. There were only two cases in which death of the fœtus might be associated with a pelvic presentation. Tumours occurred in three cases, and in all these spontaneous cephalic version took place. Prematurity is closely associated with pelvic presentations at delivery, owing to the onset of labour occurring before the fœtus has had time to right itself by spontaneous cephalic version. According to our experience this frequently takes place. The onset of premature labour occurs, as it were, at a time when the fœtus is more or less in an unstable position. Had pregnancy advanced the fœtus would have been more likely to settle down in a permanent head presentation, say, after the thirty-fourth or thirty-sixth week.

While abnormal presentations can, in some cases, be assigned to specific causes, no reason can be ascribed for the vast majority. Why a fœtus which starts with a vertex presentation should be spontaneously transposed into a breech presentation, or why one starting with a breech should be spontaneously transposed into a vertex, or why a vertex should become a breech and then be re-transposed into a vertex, is at present an inscrutable mystery. The development of antenatal work is likely to extend our knowledge of these strange happenings.

We desire to direct special attention to the table containing details of the case of spontaneous version from breech to vertex. This proves that, in most instances, nature may be trusted to do what is needful. If, however, spontaneous version is deferred beyond the thirty-sixth week, it is usually wise to resort to version. It may be necessary to perform version in some cases of pelvic presentations in order to estimate the relation of the fœtal head to the diameters of the maternal pelvis.

The results of these investigations show the value and importance of antenatal work. It is only by careful and continuous examination of the pregnant woman from an early stage that we can hope to discover the causes leading to obstetric abnormalities —a prolific cause of morbidity and death in childbirth.

MULTIPLE ABORTIVE CASES OF ENCEPHALITIS LETHARGICA.

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IT has often been stated that multiple cases of encephalitis in one house are very rare. In view of the wide extension of encephalitis in Lancashire and Cheshire at the present time, the following associated groups which have been observed by us are of interest. In one household four cases which were regarded as encephalitis have occurred, in another three cases affecting three generations, and in a third household the father and son-in-law were affected.

In the first two instances attention was directed to the household through the occurrence of one well-marked case. Upon inquiry, other and preceding cases came to light who had not sought medical advice. In all instances, however, the occurrence of nystagmus (in eight of the nine cases) or other focal signs points to the sickness from which they have been suffering having also been encephalitis.

Group I.—Mrs. D., aged 21. Slight fever; pulse 136; frontal headache and sleeplessness followed by intense drowsiness for three or four nights and days, muscular twitchings accompanied by sharp pains, nystagmus and strabismus, constipation and dirty tongue. Inquiries showed that her mother, aged 50, and grandmother, aged 80, had previously been ill, the onsets dating back 10 days and 21 days respectively. The mother had general weakness and feeling of faintness and noticed that she was dropping things; she was feverish for some days and had a sore-throat. The grandmother had headache and marked drowsiness; lay in bed for three days sleeping most of the time. One day she felt "as if a brown veil were over her face" obscuring vision. Nystagmus was present in both cases.

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Group III.—A. J. E., aged 60. Diarrhœa for three days, followed by headache and nocturnal restlessness; general weakness. When seen at the end of the week nystagmus was present and persists. His son-in-law, 25 years, also suffered from headache, diarrhœa, and slight fever (up to 100° F.); nystagmus is also present.

It may be added that all three groups of cases are immediately adjacent to each other and have occurred during March, 1924. The following group of cases was seen on May 22nd last:—

Group IV.—L. E., aged 7. Onset May 15th. Vomiting and headache, some abdominal pain and diarrhœa. Sleeping continually, nocturnal delirium. Diplopia on May 21st. Nystagmus present.

D. E., aged 10. Onset May 20th. Headache, feverish, slightly delirious one night. Nystagmus.

E. E., aged 8. Onset May 21st. Severe headache. Flushed, but at times cyanotic. Rambling delusions, saw birds flying in through the door. Diplopia, but no strabismus or nystagmus.

When examining the last case the mother volunteered the statement that about Christmas, 1920, she had a similar illness, that she was three weeks in bed, very ill and "saw monkeys and birds." She has never been well since then. Has headaches, is very nervous, and sleeping very badly. Recently the headaches have been worse, and she has been abnormally sleepy. There can be little doubt that in 1920 she suffered from an attack of encephalitis which was missed, and during a slight relapse she became infective and infected her three children, none escaping. The three children were removed to hospital and all made good recoveries without any further developments.

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During the spring of 1923 a considerable outbreak of encephalitis lethargica affected Liverpool and vicinity, the Wirral area in Cheshire and the western side of South Lancashire being simultaneously affected. This year there has been an extensive outbreak in the south-eastern area of Lancashire and the north-eastern area of Cheshire, Manchester in the centre of this district being especially attacked. The area affected last year has largely escaped this year, and it seems not improbable that the area surrounding Liverpool has been immunised to a considerable extent.

The phenomenon is similar to that reported by Wickman[4] and W. Wernstedt[5] in Sweden in relation to epidemic poliomyelitis, with which disease epidemic encephalitis presents the closest epidemiological analogies. The latter states:—

> "A comparison between the localisation of the principal centres of the large epidemics of infantile paralysis thus displays: (1) that in most places the new and old centres are immediately adjacent to each other; and (2) that, notwithstanding this, only a few scattered cases of infantile paralysis were observed during 1911 within the limits of the old centres, while, *on the other hand*, in 1905 only a few scattered cases occurred in those places which during 1911 became the seats of the large foci."

Draper[6] states "as a rule localities which have been visited one year by an epidemic of poliomyelitis have fewer or no cases the next year." Although many mild cases have been reported in Liverpool this year, it would appear that this observation is proving roughly true with regard to encephalitis, but one cannot expect that the immunity produced by an epidemic in a large town would be effective throughout its whole area in the manner that may be produced in a small rural community.

References.

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Seven *fœtal deaths* occurred in the cases of head presentations due to fœtal distress and application of forceps at term. In all of these spontaneous version had taken place some weeks before term. The other deaths were due to early onset of labour where the fœtus was not viable.

Extended Legs.—The chief factor which influences the persistence of pelvic presentations is extended legs, where the lower limbs act as a brace to prevent the natural flexion of the spine taking place. This is one of the most obstinate conditions with which we have to deal, and the most common cause of failure to perform version. X ray examinations have demonstrated the extension of the lower limbs and back. If the spine of the fœtus is curved and the limbs flexed rotation easily takes place. Any interference with this attitude may influence the persistence of pelvic presentations. In some cases it cannot be overcome by anæsthesia, which to a certain extent renders the performance of version easy by relaxing the resistance of the abdominal and uterine walls. Although manipulations under anæsthesia cannot in every case alter the abnormal attitude of the fœtus, it may alter later spontaneously to a head presentation.

Diagnosis of Pelvic Presentations during Pregnancy.

Special attention must be paid to the mobility, roundness, and hardness of the head in the fundus of the uterus, and to the groove of the neck together with the absence of this pole from the lower uterine zone. It must be remembered, however, that in cases of extended legs the pelvic pole is compact and hard, and easily mistaken for the cephalic pole, more especially when it is deeply engaged in the cavity of the maternal pelvis.

We did not find the localisation of fœtal heart sounds round the umbilicus to be a reliable guide. The diagnosis in a large number of the cases was confirmed or contradicted by X ray examinations, and accurate information as to the attitude of the fœtus was obtained, more especially in cases of persistent pelvic presentations in which the fœtal spine was seen to be extended, and attempts at version failed, owing to the rigid condition of the spine and lower limbs.

We are much indebted to Dr. Ulysses Williams and Sister Cooper for their keen enthusiasm and help in procuring skiagraphs. So far no harmful results to the fœtus have been observed as a result of exposure to X rays.

The weeks in which spontaneous version occurred were charted as near as possible to a particular week, and although no doubt errors and mistakes in diagnosis have occurred the observations have been carried out with the expenditure of much time and care on the part of the staff. There are gaps in the diagnosis in some cases owing to the patients failing to attend at regular intervals for abdominal examination. Calculations as to the date of pregnancy were based on the menstrual period as being, of all the unreliable methods, the most reliable. Confirmation was gained by estimating the size and height of the uterus, and the relation of the presenting part to the maternal pelvis.

Treatment of Pelvic Presentations during Pregnancy.

Since spontaneous version occurs so frequently it is as well to leave the fœtus alone to adjust itself in the earlier weeks, and as spontaneous version as a rule takes place between the twenty-eighth and thirty-fourth weeks no attempt at interference should be made before the latter date. If version is easily performed it would in all probability have taken place spontaneously, and experience has shown that in some cases of failure spontaneous version has occurred subsequently. If the pelvic presentation persists in a primigravida after the thirty-sixth week version is advisable, as it may prevent complications in labour, or failure may at least give an indication of difficulties ahead. In multiparæ version is seldom indicated, as in a number of cases where it has been performed the fœtus has again rotated on its axis. In cases of elderly primigravidæ in which version has failed owing to extension of the legs, delivery by Cæsarean section should be considered, as the results to the fœtus are otherwise unsatisfactory.

The chief dangers of version are the bringing on of premature labour by sensitising the uterus, strangulation of the cord, and separation of the placenta by undue manipulation with consequent formation of retro-placental hæmatoma and death of the fœtus.

Summary.

This investigation has not clearly disclosed the factors which influence pelvic presentations. Deformities of the fœtus can be eliminated to a large extent as only one case of hydrocephalus was observed. The length and weight of the fœtus, or the length of the umbilical cord, have been shown to be of little value as determinant factors in spontaneous version or in the prevention of version. Excessive liquor amnii may be a factor, but, as the percentage of cases was small, much importance cannot be given to it. Twins, for their better accommodation, have a tendency for one fœtus to occupy the lower portion of the uterus with its pelvic pole. The occurrence of pelvic deliveries is frequently due to the premature onset of labour. Deformities of the pelvis are not a marked factor as only two were found in 33 pelvic deliveries. Other cases of pelvic contraction corresponded in frequency with those found in the control cases. There were 21 cases of induction of labour, mainly for fœtal and pelvic disproportion or for cardiac and pulmonary diseases, 8 in primigravidæ and 13 in multiparæ. With two exceptions the disproportion cases resulted in head deliveries.

It was observed that in a considerable number of cases the occiput failed to rotate to the front early in labour, and many of these required manual rotation. Globularity in the shape of the uterus has been given as a cause of pelvic presentations, but our investigations furnish no new information regarding this hypothesis. It is difficult to estimate the degree of globularity of the uterus during pregnancy with any flexed standard; in pelvic polar presentations the effect is difficult to separate from the cause. In cases of extended legs there can be little globularity present. The influence of placenta prævia is difficult to estimate, owing to the frequency of interrupted pregnancies and the complication of treatment by version to bring about a footling presentation. There were only two cases in which death of the fœtus might be associated with a pelvic presentation. Tumours occurred in three cases, and in all these spontaneous cephalic version took place. Prematurity is closely associated with pelvic presentations at delivery, owing to the onset of labour occurring before the fœtus has had time to right itself by spontaneous cephalic version. According to our experience this frequently takes place. The onset of premature labour occurs, as it were, at a time when the fœtus is more or less in an unstable position. Had pregnancy advanced the fœtus would have been more likely to settle down in a permanent head presentation, say, after the thirty-fourth or thirty-sixth week.

While abnormal presentations can, in some cases, be assigned to specific causes, no reason can be ascribed for the vast majority. Why a fœtus which starts with a vertex presentation should be spontaneously transposed into a breech presentation, or why one starting with a breech should be spontaneously transposed into a vertex, or why a vertex should become a breech and then be re-transposed into a vertex, is at present an inscrutable mystery. The development of antenatal work is likely to extend our knowledge of these strange happenings.

We desire to direct special attention to the table containing details of the case of spontaneous version from breech to vertex. This proves that, in most instances, nature may be trusted to do what is needful. If, however, spontaneous version is deferred beyond the thirty-sixth week, it is usually wise to resort to version. It may be necessary to perform version in some cases of pelvic presentations in order to estimate the relation of the fœtal head to the diameters of the maternal pelvis.

The results of these investigations show the value and importance of antenatal work. It is only by careful and continuous examination of the pregnant woman from an early stage that we can hope to discover the causes leading to obstetric abnormalities —a prolific cause of morbidity and death in childbirth.

MULTIPLE ABORTIVE CASES OF ENCEPHALITIS LETHARGICA.

By C. O. STALLYBRASS, M.D. Lond., D.P.H.,
Assistant M.O.H., Liverpool;
and
A. S. McNEIL, L.R.C.P. & S. Edin.

It has often been stated that multiple cases of encephalitis in one house are very rare. In view of the wide extension of encephalitis in Lancashire and Cheshire at the present time, the following associated groups which have been observed by us are of interest. In one household four cases which were regarded as encephalitis have occurred, in another three cases affecting three generations, and in a third household the father and son-in-law were affected.

In the first two instances attention was directed to the household through the occurrence of one well-marked case. Upon inquiry, other and preceding cases came to light who had not sought medical advice. In all instances, however, the occurrence of nystagmus (in eight of the nine cases) or other focal signs points to the sickness from which they have been suffering having also been encephalitis.

Group I.—Mrs. D., aged 21. Slight fever; pulse 136; frontal headache and sleeplessness followed by intense drowsiness for three or four nights and days, muscular twitchings accompanied by sharp pains, nystagmus and strabismus, constipation and dirty tongue. Inquiries showed that her mother, aged 50, and grandmother, aged 80, had previously been ill, the onsets dating back 10 days and 21 days respectively. The mother had general weakness and feeling of faintness and noticed that she was dropping things; she was feverish for some days and had a sore-throat. The grandmother had headache and marked drowsiness; lay in bed for three days sleeping most of the time. One day she felt "as if a brown veil were over her face" obscuring vision. Nystagmus was present in both cases.

Group II.—M. M. B., aged 21. Had an attack in February, 1923, of what was then regarded as influenza, with pain and weakness in the legs. She had a similar attack in February last and continued in indifferent health till March 25th, when she had severe headache, marked drowsiness combined with inability to sleep, aching and weakness in the legs. Nystagmus is present. About a month ago Mrs. C., sister-in-law of the patient, felt as if she had no energy; definite lethargy. Now appears well except that nystagmus is present. A fortnight later Mrs. B., the step-mother, suffered from headache and sleeplessness and felt tired. Says that her symptoms resembled those of Mrs. C. Definite ptosis and nystagmus are now present. Baby B., aged 14 months, step-sister, had diarrhœa, which lasted a few days, and marked irritability, also retraction of the head and nuchal tenderness which raised suspicions of cerebrospinal meningitis. This passed off spontaneously in a few days, but the child is now sleeping more than usual.

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able all day, the internal piles are greatly reduced in size, and when they do occasionally protrude a little after a constipated motion are easily reduced and do not prolapse again. I have no feeling of "bearing-down," no bleeding, and no burning sensation.

I am unable to say how the treatment acts. The B.P. does not include pitch, the nearest approach to it being tar (pix liquida). Hale-White (1918) states: "Some of its constituents are excreted by mucous membranes, especially the bronchial, on which it acts as a disinfectant stimulating expectorant."

A CASE OF

RUPTURE OF MUSCULAR BELLY OF BICEPS BRACHII DUE TO DIRECT VIOLENCE.

BY GEORGE A. MASON, M.B., B.S. DURH.,
CASUALTY OFFICER, ROYAL NORTHERN HOSPITAL, LONDON.

CASES of ruptured muscles, apart from lacerations, are sufficiently uncommon to be of interest, and the present instance of rupture of a portion of the muscular belly of the biceps brachii seems worth recording.

E. P., aged 34, spinster. She was seen first on Jan. 22nd, 1924, complaining of injury to the right arm, sustained about an hour previously. As she was stepping off a bed on to a chair she tripped, and whilst trying to push away the chair with her right hand she missed it, and the back of the chair hit the inner side of the right arm. The blow was followed by a very violent pain, which she likened to a cut, and she noticed a "gap" in her muscle. On examination there was an obvious gap in the inner portion of the muscular belly of the right biceps brachii in its lower third. This gap was very painful to the touch; it could be felt to widen when the muscle was actively contracted, and to diminish when in the fully relaxed position—in full flexion and supination. The full ranges of movements were present, but associated with pain, and a definite diminution in power.

Treatment.—The muscle was immobilised in its fully relaxed position, and a compress of lotio plumbi c. opio applied. Two days later the gap was no longer obvious, owing to the evidence of bruising of the skin and subcutaneous tissues, but was still definitely palpable. The compress was reapplied, the arm re-fixed, and the patient advised to undergo operation for repair of the muscle. This was carried out on Jan. 28th, six days after the injury.

Operation.—Dr. Benzecry induced anæsthesia with chloroform and maintained it with open ether. The limb was fixed to an arm table, fully supinated, and at right angles to the body. A "hockey stick" incision about six inches long was made over the right biceps in the vicinity of the rupture. The ecchymosis was found to be purely subcutaneous and not to extend beneath the deep fascia, which was opened in the line of the skin incision. The muscle sheath was opened over the site of the rupture, and the severed fibres at once exposed to view. There was no evidence of either blood-clot or effusion between the ends of the fibres, which were quite cleanly divided. The severance just involved that portion of the belly internal to the mesial septum, and did not extend right through the thickness of the muscle, a few fibres posteriorly being still intact. The severed portions were carefully reapproximated with interrupted sutures of catgut, going through the whole thickness of the divided half of the muscle. The muscle sheath was closed with catgut sutures and the skin and fascia closed in layers with the same material. A firm dry dressing was applied and the arm bandaged with the forearm fixed in full flexion and supination. The wound was quite healed twelve days later and massage commenced. After a further seven days this was supplemented by active and passive movements. On March 14th, 1924, or about six weeks after the accident, the arm being satisfactory in every respect, the patient was discharged.

Comments.

1. Presumably the muscle must have been in a state of active contraction when it received the blow. It is difficult to conceive of a flaccid muscle rupturing under such circumstances. 2. The loss of movement immediately after the accident was almost negligible. 3. The clean-cut appearance of the severed edges of the muscle, the absence of any infusion, and the limitation of the bruising to the skin and subcutaneous tissues may be usual in such cases, but occasioned the writer considerable surprise. 4. The "hockey stick" incision gave satisfactory exposure, obviated the use of retractors, and consequently is of great help where the operator is unassisted, as in this case.

Reviews and Notices of Books.

ON THE BREAST.

By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., Ch.M., F.R.C.S. London: Heinemann. 1924. Pp. xv. + 440. 30s.

THE purpose of a large monograph upon a single small portion of the body may be presumed to be to present in an accessible form all the known facts concerning the part which may throw light upon the pathology and treatment of the diseases to which it is subject. It is disappointing, therefore, to find at the outset that the author of this book regards it as unnecessary to include "in a book whose primary object is to deal with the surgery of the breast" any account of the physiology of that organ. The physiology of the breast is a difficult and complicated subject, but it is so intimately bound up with the pathology of the breast, and therefore with its surgery, that this omission is to be regarded as unfortunate. Since more than 50 pages are devoted to the interesting, but relatively unimportant, subject of congenital abnormality and gynæcomastia, lack of balance is one of the first impressions received by the reader. This is not, however, a charge that can be levelled at the remainder of the book, provided that it be understood that few authoritative statements upon pathological problems are to be expected. The book is packed with accurate clinical observations and bears evidence throughout of extensive clinical experience and wide reading on the part of the author. The various pathological conditions found in the breast are dealt with serially, and each receives its just modicum of attention. The arrangement is in some respects peculiar, and reflects the uncertainty upon many pathological points with which the author is evidently troubled. Thus sections upon a condition called "lobar mastitis" and upon "chronic mastitis in the male," are separated by nearly a hundred pages from the section dealing with "chronic interstitial mastitis" in the female. As to cysts of the breast, the author leaves the subject in almost the same confusion as enveloped it in the days of Sir Astley Cooper. However, if the author's pathological judgments are obscure, his clinical pronouncements are assured, and these, being based upon wide experience, are undoubtedly of the greatest value.

The illustrations, no list of which is vouchsafed, are numerous and consist almost entirely of line drawings. These are admirably adapted for presenting certain aspects of the breast; the 33 drawings, for instance, of supernumerary and aberrant breasts are almost uniformly clear and interesting. It may be doubted, however, whether the curious object depicted on page 45 as growing upon the thigh of a man is really a mammary gland at all; the text contains no reference to this intriguing case. The majority of the drawings of pathological specimens are so rough that they convey little to anyone not already very familiar with the subjects represented. It is not part of the author's plan to give any attention to the histology of the diseases described. The book does contain reproductions of three microscopic sections borrowed from other authors, but it is difficult to see why these three in particular should have been chosen to the exclusion of all others.

Mr. Fitzwilliams is to be congratulated upon a gallant attempt to fill what he feels to be a gap in medical literature. The statement in the preface, however, that no book on the breast has appeared for 20 years is not wholly correct, for a monograph of about the same extent as the present one was published last year and was reviewed in THE LANCET of Oct. 6th, 1923. No surgeon can fail to be interested and informed by reading either monograph, but the book which will materially advance knowledge of diseases of the breast, for those who are fully acquainted with the literature, still remains to be written.

Clinical and Laboratory Notes.

A NOTE ON FIVE CASES OF EPIDEMIC PLEURISY.

By Eric I. Lloyd, M.B., B.Ch. Camb., F.R.C.S. Eng.,
RESIDENT MEDICAL SUPERINTENDENT, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET, W.C.

The Lancet has recently published two communications [1] [2] dealing with the above, and it is hoped that the following notes of a small epidemic amongst the nursing staff of the Hospital for Sick Children, Great Ormond-street, will be of interest. This epidemic was strikingly similar to that described by Williamson as occurring at the country branch of the Paddington Green Children's Hospital, and was contemporary with it. It is curious that the last four patients were nurses from the same ward (we have eight large "general" wards), although there was no such illness amongst the children in the ward from which they came or elsewhere in the hospital.

General Characteristics of the Cases of Epidemic Pleurisy.

No. of case.	Date of onset and duration of illness.	Symptoms at onset.	Headache.	Abdominal pain.	Pain in chest.	Friction sounds detected.	Degree of pyrexia.	Course.
1.	10/6/24. 32 days.	"Not feeling well." Abdominal pain and pain on breathing.	Severe, and lasting about 10 days.	Severe.	Severe.	4th day.	104° on 4th day.	Temp. normal on 5th day, but rose to 103° on 10th day and again on 17th day. Afterwards uneventful.
2.	14/6/24. 23 days.	"Pain in chest."	Moderately severe.	Nil.	Present.	4th day.	103° on 1st day.	Temp. normal on 5th day. On 12th day rose to 102°. Uneventful afterwards.
3.	5/7/24. 12 days.	"Feeling ill." Pain in chest next day.	Present.	,,	,,	? 2nd day.	103·6° on 4th day.	No relapse. Convalescence uninterrupted.
4.	9/7/24. 6 days.	"Headache and pain in chest."	Severe.	,,	,,	9th day.	103° on 4th day.	Ditto.
5.	12/7/24. 14 days.	"Sudden attack of severe abdominal pain and pain on breathing."	Present.	Severe.	,,	Never heard.	103° on 1st day.	Ditto.

The five examples so closely resemble those already described in The Lancet that it is unnecessary to do more than to indicate their general characteristics in tabular form.

Pain in the chest and headache were the usual complaints, but Cases 1 and 5 at their onset closely simulated an early acute appendicitis for the first 12 hours, and one of them had some right rectus rigidity. The pain caused by deep breathing was so severe that the patients would not willingly indulge in it, and the probability is that pleural friction was present in all five cases, but escaped detection in some owing to the quiet respiration enforced by pain. For the same reason it was difficult to be certain of the absence of other abnormal physical signs in the chest, but as the maximum rate of respiration in three patients was 28 and in two 32, the lung substance cannot have been extensively involved; there was also an entire absence of cough. Apart from the relapses in Cases 1 and 2 (vide table) convalescence was uninterrupted, and there have been, so far, no after-effects.

I am indebted to Dr. F. J. Poynton and Dr. J. H. Thursfield for permission to publish this note.

A CASE OF HERNIA OF THE OVARY.

By W. H. Simmons, M.B., B.S. Lond., M.R.C.S. Eng., L.R.C.P. Lond.

The following case of hernia of the ovary I believe sufficiently uncommon to prove of interest.

A female child, aged 3, was brought to hospital, her mother complaining that a small lump had appeared and persisted in the groin for about the last year. On examination a movable oval tumour, about half an inch in length and a quarter of an inch in width, was felt at about the position of the right external ring. There was little or no sensibility to be demonstrated. It rolled easily under the skin, but could not be moved over the deep structures. There appeared to be a slight impulse on crying.

The child was admitted and the inguinal canal explored by Mr. A. J. R. O'Brien. A hernial sac was found and when opened the tumour proved to be the ovary. An elongated extension of the broad ligament was present, and at about the middle of this a thickened band was adherent to the sac. This was freed, when the ovary slipped easily back into the abdomen. The sac was excised and recovery has been uneventful.

Gold Coast Hospital, Korley Bu, Accra.

A NOTE ON THE TREATMENT OF HÆMORRHOIDS BY PITCH TAKEN INTERNALLY.

By H. W. Webber, M.S., M.D. Lond.,
SURGEON, P. AND O. STEAM NAVIGATION COMPANY.

It seems to me that a note of a personal experience of the above treatment may be of interest.

I have been a sufferer from intero-external piles about 40 years, and the condition has got worse with advancing age. Recently the boatswain of the ship of which I am surgeon, hearing of my complaint, volunteered to cure me if I would follow his treatment. I assented.

At nearly every evacuation there was a protrusion of the size of a bunch of currants. I reduced it every time after smearing with ung. gallæ c. opio and ung. zinci, equal parts, washed the anus well, and practised as far as possible voluntary contraction of the sphincter muscles. The trouble did not improve, and often I had to reduce the prolapsed mass two, three, or more times a day. The anus was, moreover, in a chronic condition of discomfort. On April 12th the boatswain sent along about a dozen pitch pills rolled by himself. I commenced the treatment. An average-sized pill weighed 10 gr. I took one with my tea at 6.30 A.M., and one with afternoon tea at 4 P.M. Improvement was noticeable in about a week, and on April 24th, after a constipated motion passed with much straining, there was no prolapse, the first time for many years. Now, May 9th, I am comfort-the average systolic and pulse pressures of the boys were appreciably higher than in a more easy-going school, whilst the pulse-rate was reduced in compensation.

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[1] Williamson, Bruce: The Lancet, 1924, ii., 64.
[2] Sutherland, G. A.: Ibid., 194.

It will be seen that Dr. Stocks has made observations upon a number of important points and it is possible that some of his findings will be challenged. In accuracy of method and clearness of exposition the memoir reaches the usual standard of the Galton Laboratory, which is very high praise and in itself adequate reason for congratulating the author.

The Principles of Vital Statistics.

By I. S. Falk, Ph.D., Department of Public Health, Yale University. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 258. 12*s.* 6*d.*

This little book describes the method of taking a census, the principal averages used in vital statistics, and some of the more important source of statistical fallacies. It is intended mainly for American readers and does not show much familiarity with modern statistical methods, but it is clearly written and can be read with advantage by most medical men—unless they are hypersensitive to violations of the rules of old-fashioned English grammar.

Cytology.

An Introduction to the Study of Cytology. By L. Doncaster. Second edition, revised by J. Gray. Cambridge: University Press. 1924. With 24 plates and 31 text figures. Pp. 280. 21*s.*

Prof. Leonard Doncaster died soon after the publication of this popular book in 1920. It has been revised for a second edition by Dr. J. Gray, who has added a certain amount of fresh material, especially on the experimental side with which he is specially familiar. There is no need to commend the book to our readers. Pending the new edition which is promised of Prof. E. B. Wilson's "The Cell in Development and Inheritance"—and perhaps even then—it is certainly the best available book on a subject which in some parts has advanced so wonderfully in recent years. The chapter on the rôle of the cytoplasm is of special interest. It indicates a line forward which by general consent is likely to be fruitful. What is remarkable about the book is the fact that the contents deal only with a limited section of the subject named in the title. By far the greater part is occupied by germ-cells, fertilisation, and inheritance, and anyone who looks in it for a discussion of the cytology of secretion—surely at least as important if a less dramatic subject—will be disappointed. Unless the scope of the book is altered we would suggest that the title should be reconsidered in the third edition.

The price of the book strains our goodwill, and the descriptions of some of the plates are printed on their backs—an inconvenient arrangement.

Functional Testing of the Eye.

Die Funktionsprüfung des Auges. By Dr. W. Wick, Senior Surgeon of the Eye Clinic at Düsseldorf. Berlin: S. Karger. With 90 figures. Pp. 146. 5·40 gold marks.

This little book contains an account of refraction in theory and practice, including the shadow test, the astigmatic fan, and the ophthalmometer; an account of tests for the field of vision, in which, however, there is no mention of the modern modifications of the perimeter for testing the light sense: a plan resembling, but apparently inferior, to Perceval's test is mentioned; and sections on binocular vision, squint, and the detection of simulation follow. The book ends with a chapter on the physiology and pathology of the pupil, illustrated by useful diagrams, and appears to be a useful elementary guide to its subject.

Manipulation de Chimie Colloidale.

By W. Ostwald. Translated by Edmond Vellinger. Paris: Gauthier Villars. 1924. Pp. 201. Fr.6·50.

The German edition of this work is well known to most teachers. The translator in his preface states that he has attempted to adhere to the original German conception of the book and that he hopes to have rendered service to all French workers in the field of colloidal chemistry. That he will have accomplished his object there can be no doubt, since the whole spirit of the book is reproduced in the French language. The methods of preparing, testing, and experimenting with all the common colloidal solutions are fully described, and the book merits success.

Forensic Medicine.

Practical Forensic Medicine. A Police Surgeon's Emergency Guide. Third edition. By C. Graham Grant, V.D., L.R.C.P. & S. Edin., Lieut.-Col. R.A.M.C. (T.); Barrister-at-Law, Gray's Inn; Ex-Divisional Surgeon, H. and Thames Divisions, Metropolitan Police; Ex-Surgeon, Poplar Hospital; Clerk of Arraigns, Central Criminal Court. London: H. K. Lewis and Co., Ltd. 1924. Pp. 98. 4*s.* 6*d.*

This little manual, now in its third edition, contains a considerable amount of information of a practical type. The police surgeon faced with emergency work has to consider not only the immediate treatment of the case, but also possible future legal proceedings; he will find in this little pocket-book a wealth of sound advice by one who has had years of experience in police work. The material is well arranged and the writer may be congratulated on having set forth so much information within so small a space. The section on poisoning is sound, but details of treatment are occasionally so brief as to be difficult to interpret. Emphasis might be laid on the importance of washing out the stomach with the antidote, especially as there is often great difficulty in swallowing, and time is an important factor in many cases. The indications for general restorative treatment might be given briefly and the use of antagonistic drugs. In connexion with strychnine poisoning there is no mention of chloral hydrate. A glossary of trade names for various chemical substances might also be added with great advantage. Medical men are made familiar in the course of their training with the scientific names of substances, but when a patient is brought by his mates having swallowed a substance described as "spent acid," "oil of tar," or "butter of antimony" for example, much valuable time may be lost in determining the exact nature of the poison in question. A pronouncement as to a medical man's duty in a case of attempted suicide who refuses and resists treatment might also have been given. The adoption of these suggestions. in the subsequent issue that will be called for, would not materially increase the bulk of the book and would make it even more useful to those harassed, patient, and competent medical officers for whom it is intended.

A Handbook of Medical Jurisprudence and Toxicology. Fifth edition, revised. By William A. Brend, M.A. Camb., M.D., B.Sc. (Lond., of the Inner Temple, Barrister-at-Law; Lecturer on Forensic Medicine, Charing Cross Hospital; Medical Referee under the Workmen's Compensation Act. London: Charles Griffin and Co. 1924. Pp. 317. 10*s.* 6*d.*

This volume is too well known to require any lengthy review. The present edition has been brought up to date, and new matter introduced such as the recent legislation affecting medical men.

A BIBLIOGRAPHY OF SIR THOMAS BROWNE, KT., M.D.

By GEOFFREY KEYNES, M.A., M.D., F.R.C.S. Cambridge: At the University Press. 1924. Pp. 256. 42*s*.

To review a bibliography is not easy, for the work is such that if it is well done the reviewer must know much less of the subject than does the bibliographer. To lovers of Sir Thomas Browne, Mr. Geoffrey Keynes's work will be a source of great pleasure, while he gives a reproduction of a hitherto unpublished portrait of Sir Thomas and of the only known portrait of that admirable woman, Dorothy Browne, his wife. (See figure.) There is an appendix dealing with the writings of Dr. Edward Browne (of whom the late Sir Norman Moore has written), and another one giving an account of Simon Wilkin, the printer and publisher of Norwich to whom we owe the best edition of the collected works of Browne, an edition published 1835–36. The book is dedicated to the memory of William Osler, and were he alive to see it no one would appreciate it more at its proper worth than that cultivated and charming physician who had many of the characteristics of the scholar physician whom he loved so well.

Reduced reproduction of the frontispiece of Mr. Keynes's "Bibliography of Sir Thomas Browne."

(By permission of the Cambridge University Press.)

A STATISTICAL STUDY OF BLOOD PRESSURE.

Blood Pressure in Early Life: A Statistical Study. By PERCY STOCKS, M.D., D.P.H., assisted by M. NOEL KARN. Cambridge: At the University Press. 1924. Pp. 88. 12*s*.

THIS addition to the series of research memoirs, issued by the Department of Applied Statistics of University College, contains a careful study of blood pressure readings by Dr. Percy Stocks. The author deals with material covering the period from childhood to early middle life, and prefaces his statistical analysis with a critical consideration of the various methods of measurement. In his opinion, the auscultatory method is much more reliable than the palpatory, and he finds that the latter method gives readings for systolic pressure averaging 14 mm. less than those of the auscultatory method in young adults. For diastolic pressure, Dr. Stocks finds the best index to be the end of the third phase of sound, marking the change from a clear to a dull sound, audible on gradually releasing the pressure of the armlet. The changes which occur in pressure and pulse-rate on rising from sitting to standing posture vary much in different individuals; the mean effect in males is a rise of 3 mm. in systolic and of 10 mm. in diastolic pressure. The average increase of pulse-rate is 7·5 beats and there is a fall of 7 mm. in pulse pressure. In females there is on the average no increase in systolic pressure and that of diastolic pressure is about 5 mm. The changes in pulse-rate and pulse pressure are similar to those observed in males. Dr. Stocks did not find any evidence that these reactions could be used as an index of physical fitness, but he does not discuss Flack's work on this point.

Both racial and social differentiation were found to be associated with differences of average systolic pressure, but Dr. Stocks did not find any evidence in support of the commonly accepted opinion that blood pressure increases throughout life. Up to 11 years of age the mean systolic pressure rises uniformly, and during adolescence the gradient is temporarily increased, but the pressure attains a uniform adult level at about 18 years of age, showing no further tendency to increase up to the age of 35–40. The diastolic pressure reaches a maximum at about 20 and then falls slightly until the age of 35 years. Pulse pressure increases uniformly to the age of 15 years, during adolescence attains a high maximum at 16–18, then falls to its original level by 20, and thereafter slowly increases up to the age of 40. Blood pressure is correlated with bodily development apart from age, and the author provides graphs and tables to define the limits of probable normality for persons of known age, weight, stature, and pulse-rates. In this way the range of variability may be reduced, but is still considerable, since other factors, such as social class and heredity, are involved. Regular physical exercise tends to keep the diastolic pressure at a lower level, but there is little evidence of correlation between vital capacity or efficiency in tests of respiratory force and blood pressure. The influence of psychological factors upon blood pressure is considerable. In schools where a strict discipline was maintained

THE LANCET.

LONDON: SATURDAY, AUGUST 9, 1924.

THE PREVENTION OF DISEASE.

The Presidential Address at the meeting of the British Association for the Advancement of Science, which opened this week in Toronto, was delivered by Major-General Sir David Bruce, President of the Association, who with characteristic simplicity estimated the honour of the position which he enjoyed as a recognition through him of the magnificent work performed by medical officers during the war, both for the prevention of disease and the alleviation of pain and suffering. He took for his subject the prevention of disease and treated it, in spite of its vastness, in a symmetrical and succinct manner, so that a heterogeneous mass of information was assorted into a coherent story; and to-day, when far-reaching researches are being undertaken at many widely separated centres, when the old knowledge is being sifted and sorted for rejection or for adaptation to the new, and when all society is in a state that is producing new factors for good or ill, this is an achievement.

Sir David Bruce first dealt with the infectious diseases, which he subdivided into three groups, bacterial, protozoal, and undetermined, in accordance with their ætiology. A glance at the comparative size and importance of these groups forms remarkable testimony to the research work which has been and is being carried on by men whose names, like the name of David Bruce, occur repeatedly wherever a writer or a speaker attempts to tell the story of the progress of science. Prevention as a sequel to cause is displayed in each group. As soon as it was recognised that infectious diseases are caused by living germs a series of magnificent discoveries were made, and tuberculosis, typhoid fever, cholera, diphtheria, tetanus, and Malta fever, all in turn, yielded their secrets and became susceptible to scientific prophylaxis. In the second great group of infectious diseases, the protozoal, the discovery of the malaria parasites inaugurated research which led to the discovery of the causes of Texas fever, nagana or tsetse-fly disease, sleeping sickness, yellow fever, and kala-azar, and in some proportion to the extent to which the natural history of these different diseases has been worked out is it evident that prevention can be attempted. But in addition to the bacterial and protozoal infectious diseases there is a third and large class, styled by Sir David Bruce the undetermined group, where no parasite, bacterial or protozoal, has been identified, in which category is included the common diseases such as measles, scarlet fever, and small-pox, as well as dengue fever, sand-fly fever, and the vaguely defined condition known as trench fever. To this undetermined class belongs foot-and-mouth disease, whose incidence is so disastrous and so costly upon animals, as well as the other plagues which are assumed to be due to a filter-passing virus, though in the case of foot-and-mouth disease there is now good evidence that the living germ has been identified. Concerning each disease, as it falls under one or other of these groups, Sir David Bruce furnished brief and accurate information, attributing to the various workers their share in the task of discovery, and indicating the lines on which medical science could devise schemes of prevention with the coöperation of the intelligent public.

From this point the speaker went on to indicate that scientific advance had not been limited to the infectious groups, but could be recorded in conditions which did not belong to that category, notably in diseases due to dietetic deficiency. In words that would have appealed to Rousseau, Sir David Bruce pointed out that the untutored savage, living on the natural fruits of the earth and the chase, knew no deficiency disease; the habits of civilisation with its unnatural environments and sophisticated foodstuffs being associated with these conditions. An exemption similar to that enjoyed by the savage may, however, be the lot of man when he is living in comfort and drawing his food-supply from far-ranging sources, which allow of full variety in diet; but where, in what purport to be civilised conditions, adults and children live in unnatural circumstances—such as prevail in institutions—or where armies are on active service, or when extremes of climate have to be encountered, deficiency diseases appear; and where young children, whose range of diet is restricted, have to go short of the needful provision these diseases develop with particular mischief to the race, for social inefficiency results if the deprivation is severe or prolonged. And in speaking of the treatment of deficiency diseases Sir David Bruce laid full stress on the value of sunlight, quoting here the researches into the interaction of diet and light in the prevention and cure of rickets in infants which were carried out by Dr. Harriette Chick and her colleagues in Vienna, and which from time to time have been fully recorded in The Lancet. The Presidential Address fully justified the choice of a physician for its delivery, for it placed medicine in the forefront of the activities which make for good in the world.

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FUNDAMENTAL CANCER KNOWLEDGE.

The fourth instalment of the summaries issued by the Departmental Committee on Cancer has just been sent out by the Ministry of Health to local authorities throughout the country, and is available for general information at a nominal cost. The pamphlet is abstracted on page 285. It is the result of an invitation to Dr. J. A. Murray, Director of the Imperial Cancer Research Fund, in consultation with other members of the Committee, to furnish a brief review of the main lines followed by experimental cancer research in recent years, and of the broad conclusions, negative as well as positive, which may now be adduced. The circular, as we have noted, is addressed to local authorities in England and Wales, and it may be asked: What has experimental research to do with the practical hygiene of the community? It is well that this question should be put and answered. For a generation or more all the scientific work on the cancer problem was conducted without noise or clamour, almost without making itself audible at all to the ear of popular opinion. If examples were necessary in support of this statement we should mention the recent statement of a well-known dietarian that advanced investigators are agreed that cancer is "due to a toxic irritated and stimulated condition of the system"; another, from a well-known author, who asserts, without the slightest fear of contradiction, that cancer "can only grow from a cancer

There is no doubt that the volume has proved of great value both to students and practitioners. Although in important matters, where a full knowledge of a subject is required, it is necessary to consult the larger text-books, especially as to details of cases, Dr. Brend's book may be relied on to supply anyone with a sound general view of the majority of forensic and toxicological questions.

The volume is of convenient size; it is perhaps a pity that a slightly larger type was not used, especially from the point of view of the student. At the stage of his career when he is reading a book of this kind, he is or should be spending several hours a day reading for his final examinations. Authors and publishers alike should, therefore, bear in mind questions of eye-strain.

MANAGEMENT OF DIABETES.

By GEORGE A. HARROP, Jr., M.D., Assistant Visiting Physician, New York Presbyterian Hospital. New York: Paul B. Hoeber, Inc. 1924. Pp. 190. $2.00.

THIS manual represents the teaching which has been given to some 600 physicians, as well as nurses, who have visited the Presbyterian Hospital in order to learn how to use insulin. A short account is given of the elements of normal and disturbed metabolism and of the acid-base mechanism. The properties of insulin are described and the plan of treatment used at the Presbyterian Hospital is explained. Four illustrative cases are then set out with the details of the management of the insulin. All the cases seem mild according to the standards of hospital practice in this country. An attempt is made to keep the urine sugar-free, but no special effort is made to maintain a normal blood-sugar. The calorie value of the diet is a high one and the carbohydrate ration used for the mild cases is ½ g. of sugar for normal body-weight. Details are given of the method of treating coma, and the importance of searching for infections in every case of diabetes is insisted on. Various recipes and good diet tables are given.

There is an accurate index, and the book should be useful to practitioners.

THE PHARMACISTS' BOTANY.

By GEORGE B. RIGG, Ph.D., Associate Professor of Botany, University of Washington. New York: The Macmillan Company. 1924. Pp. 303. 16s.

BOTANY as a subject for the qualifying examination in pharmacy does not, as a rule, find favour among professional pharmacists and students in this country. Whether this is due to the method of presentation or not it is difficult to say, but in view of the close connexion between botany and materia medica it is not unreasonable to suppose that the failure on the part of the pharmacist to appreciate the study of botany may be due to lack of imagination on the part of his teacher. Dr. Rigg states that his book is the result of 14 years of "teaching pharmacy botany —eliminating non-essentials so often stressed—and seeking ever more practical means of presenting the subject to the best advantage with the least waste." He has, on the whole, succeeded in producing a concise and interesting manual. In his desire to be brief he has not always maintained the balance between text and illustrations; thus the description of karyokinesis is confined to about a dozen lines of text, though it is accompanied by a figure composed of 12 plates, inadequately described; on the other hand, the descriptions of the microscopic appearance of cross-sections of typical monocotyledonous and dicotyledonous stems could have been made considerably clearer by a few more illustrations of tracheids, bordered pits, and the like, since the use of such terms without illustrations is not likely to convey much to the reader. The chapter devoted to the classification of seed plants is the longest in the book and is the one which brings the subject in closest relation to pharmacy, since the brief description given to each family is followed by a list of official drugs belonging to such family. Perhaps the least satisfactory chapter is that dealing with physiological processes; the student's conception of osmosis, for example, is hardly likely to be improved by the statement that "the tendency of the solute is to diffuse toward the solution containing the greater number of particles in solution." Again, the inclusion of a number of essential oils in the section devoted to fatty oils and their inter-relationship with carbohydrates is unfortunate: in this chapter also are to be found a number of minor misprints, such as salingenin for saligenin, glutanimic for glutaminic, lycine for lysine, and amolytic for amylolytic. The frequent use of trivial names common in America, such as kinnikinnick, pipissewa, squash, &c., is liable to frighten the English reader, but the author has wisely provided an excellent index of botanical synonyms, which should remove all difficulty.

The book as a whole presents a praiseworthy attempt to provide the pharmacist with an outline of the subject of botany, written in a concise, intelligible, and attractive manner.

JOURNALS.

ARCHIVIO DI SCIENZE BIOLOGICHE. Vol. V., Nos. 3-4. Napoli. 1924.—This volume contains many interesting articles. Dr. A. Dalla Volta contributes the results of his experiments on the relation between the chemical condition and biological activity of human serum. Both distilled water and ethyl alcohol destroyed the complementary activity; alcohol had a definite coagulating action on the colloidal system represented by the serum.—An article by Dr. A. Roncato shows that the elimination of creatinine in relation to age is very different from that of urea; the two curves often show an opposite direction.—Dr. P. Radaelli found that irradiation of the testicle caused a remarkable disappearance of the spermatozoa about the tenth day; in the preceding period the action of the X rays was shown only in very slight changes in the chromation of these elements.—The influence of the nervous system on the processes of regeneration was investigated by Miss P. Locatelli, who found that the sympathetic system had no influence, but the spinal ganglia had a decided influence. The experiments were made on the tails of *Triton tremalus* and *cristatus* —Dr. G. Viale contributes four papers on energy output in human beings under various experimental conditions, working on similar lines to the late A. D. Waller in this country. He concludes that the same quantity of work performed in a given time modifies the heart condition, respiratory exchange, and energy output in a different way according as the work is done slowly or quickly, as by raising a heavy or light weight, the extent of the movement remaining constant. The ouput of the human motor, like the mechanical, is greater when the muscles have to perform a lighter task, even if the rate is more frequent. The physiological cost is less when the force necessary for executing the work is small, and the work is more economical if the task is distributed even though the actual movement is more extensive.—The action of alcohol on the muscular contractions in frogs is the subject of a paper by Dr. C. Pulcher, who concludes that it causes an increase in the tonic phenomenon of the contraction.—Dr. G. Quagliariello publishes the communication which was made to the International Congress of Physiology at Edinburgh in 1923 on theories of muscular contraction.—Drs. M. Bolaffio and Artom record their experiments on the physiology of the nervous system of the human fœtus, from which they obtained some definite and striking results.

VASCULAR REACTIONS OF THE SKIN TO INJURY.

THE phenomenon of "dermographism" or "factitious urticaria" has recently been studied by Thomas Lewis,[1] who pointed out that the "wheal-reaction" that occurs in this condition, even on light stroking of the skin, is merely an exaggerated physiological response, a similar reaction being produced on a normal skin by stronger or repeated stimuli of the same kind. In conjunction with Ronald Grant,[2] he has now published the results of experiments on the production of wheals by means of solutions of histamine. It is shown first that reactions to stroke and histamine present similar time relations, and that the reaction consists in each case of (1) a local dilatation of the minute skin vessels, which, since it occurs when the circulation has been arrested, is a primary dilatation of these vessels; (2) a surrounding flush, due to widespread dilatation of the skin arterioles; (3) an exudation of fluid into the tissues, the rate at which exudation occurs being largely governed by the rate of blood flow through the tissue. This exudation can take place against relatively high external pressures, and is therefore not merely dependent on increased filtration pressure, but on increased permeability of the vessel wall. As a result of further ingenious experiments, the authors conclude that the primary local dilatation of small vessels is a direct effect and is independent of the nervous system, that the widespread dilatation of the surrounding arterioles is dependent on a local reflex, and that the increased permeability of the vessel wall, like the local vasodilatation, is uncontrolled by the nervous system. The total reaction of the skin, although complex, is identical for both mechanical and chemical stimuli, and also in all probability for a third kind of stimulus—namely, the thermal one, which also leads to whealing if sufficiently strong. It is, therefore, reasonable to suppose that with these three varieties of stimulus there is a common factor on which the actual reaction depends. Without discussing the experimental evidence adduced, we may say that the authors conclude that the wheal-reaction, whether produced in an urticarial person by stroking or in normal skins by stronger mechanical or thermal stimuli, is due to the liberation in the skin of a chemical substance, which acts as a vaso-dilator and at the same time increases the permeability of the vessel wall. They suggest that the same is true of the reactions produced in the skin by burns, ultra-violet light, poisons, such as peptone, mustard-oil, and mustard-gas, certain oils and other vesicants, morphia and atropine, and the substances introduced by biting and stinging insects and hairy plants. It is likely that this chemical substance is histamine or some closely allied product of tissue damage; on the other hand, it may be that histamine, when applied by puncture of the skin, as in the authors' experiments, acts like other poisons, such as morphia, and releases the hypothetical substance from the tissues to which the reaction is directly due. The researches of Dale and Laidlaw[3] on the reaction produced by injection of this substance showed that histamine causes general dilatation of the peripheral small blood-vessels beyond the main arterioles and an increased permeability of their walls, resulting in a great fall of blood pressure and collapse, a condition comparable to anaphylactic and wound shock. It has been sufficiently proved that in secondary wound shock, and in that produced by extensive burns, it is the absorption of the products of the damaged tissue that causes the profound fall of blood pressure and collapse. Bayliss,[4] Cannon, and others have shown that this secondary shock does not occur when the channels of absorption from the area of damaged tissue are closed, and Robertson and Boyd[5] produced a condition of shock in healthy animals by introducing substances recovered from burnt skin.

These researches may obviously have a very important bearing on the phenomena of anaphylaxis, sensitisation, desensitisation, and immunity.

With regard to anaphylaxis, it is possible that the various symptoms that characterise the anaphylactic state, of which an erythemato-urticarial rash is one, are directly due to the production of some histamine-like substance in the tissues, as, indeed, the work of Dale and Laidlaw, already referred to, would suggest. In this connexion it is relevant to refer to those cases in which after severe bruising without laceration of the skin or after an operation with extravasation of blood—e.g., for removal of the breast—there may follow with an interval of about ten days an outbreak of an erythemato-urticarial rash resembling a serum eruption. Dr. Arthur Whitfield has reported two cases of this kind in patients who had been bruised, and we know of the condition having occurred after operations. The interval between the injury or operation and the outbreak of the eruption corresponds closely with that between the injection of a foreign serum and the appearance of a serum-rash. It would seem likely that in these cases some substance is produced in the damaged tissue or extravasated blood which provokes the eruption. The relationship of sensitisation to anaphylaxis is obscure, but, although most examples of sensitisation cannot be regarded as truly anaphylactic, there would seem to be a resemblance between the two conditions. It is important to recognise that there are two main forms of cutaneous reaction occurring in the sensitised state, the erythemato-urticarial and the eczematous. The latter denotes epidermal sensitisation, and is well illustrated by the dermatitis provoked by poison plants and certain chemicals. Both forms of reaction, however, may coexist in the sensitised state, and just as there are persons who are prone to develop urticaria from a variety of causes, so there are those whose epidermis is so sensitive that the application of substances which are innocuous to the normal skin produces in them an acute eczematous reaction. A point of great interest is that a local sensitiveness of certain areas of the skin may exist, so that the sensitising substance may provoke a reaction on one area but not on another. This question of sensitisation must be considered in connexion with the suggestion of Lewis and Grant that the reactions produced in the skin by the substances introduced by biting and stinging insects and certain hairy plants are actually due to some product of tissue damage. In this connexion Cranston Low[6] has proved that the nettle-sting gives rise to a reaction in those who have never previously been stung, and that repeated stinging produces no immunity. It is, therefore, not a sensitisation phenomenon, but a purely mechanical irritation from the puncture of the skin by the hairs on the leaf and the injection of an irritant fluid. But in the case of biting and stinging insects the reactions would seem to be of a different nature. For Boycott has shown that in persons who have never previously been bitten by the rat-flea no reaction is produced when they are bitten for the first time, but after repeated bitings a marked reaction occurs, and this sensitiveness then persists. The same is probably true of certain stinging flies. Moreover, in the case of insect-bites, unlike the nettle-sting, immunity in time is produced, and in a person who is constantly being stung by gnats and mosquitoes, or bitten by fleas and lice, eventually no local reaction results. If the suggestion of Lewis and Grant be correct, some explanation is required as to the meaning of this sensitisation and desensitisation.

Lastly, the question of drug-rashes may be considered. In a large proportion of cases these are not specific, and a number of different drugs may provoke "type-reactions," such as erythema or urticaria, germ, born in the body of one unfortunate to find a home in the body of another unfortunate"; and a third, from a Member of Parliament, who seriously suggests aspirin, salicylates, and liquid paraffin "which have the same root as charcoal" as probable causes of the increased number of cancer cases. The cancer orchestra has now become popular, and it matters very much indeed that the instruments should play in concert, and that if the wind instruments play a trifle too loud the essential motif should not be made obscure to the local authorities.

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[1] Lewis: Heart, 1924, xi., 119–140.

[2] Lewis and Grant: Heart, 1924, xi., 209–265.

[3] Dale and Laidlaw: Jour. of Physiol., 1918–19, lii., 355–390.

[4] Bayliss: Intravenous Injection in Wound Shock. Longmans, Green and Co. London. 1918.

[5] Robertson and Boyd: Jour. of Labor. and Clin. Med., 1923, ix., 1.

[6] Cranston Low: Brit. Jour. Derm. and Syph., 1924, xxxvi., 292–311.

The policy of the Committee has been to set out broad conclusions, negative as well as positive; what is not known as well as what is known. No one except the workers themselves knows what an ungrateful task it is to draw negative conclusions. A paragraph or two in a report, a few lines in a summary, may be enough to set forth the outcome of experimental work on which the observer has spent time, energy, zeal, and ingenuity. The long and tedious road too often ends in disappointment, and there should be a particular beatitude for those who are willing to admit the negative outcome of the patient work of years; in scientific medicine it is often the humble who inherit the earth. Three hypotheses of the origin of cancer which have been promulgated with force and ability have, we are told, inspired no experiments leading to the production of a new growth of more than a temporary character. The hypothesis that cancer is due to invasion by a parasitic micro-organism; the suggestion that during fœtal life small islands of cells become isolated to take on independent growth later; the assumed resemblance between the division of cancer cells and of germ cells, leading to the inference that cancer growth depends on a reversion to the sexual type of cell division—these conceptions have produced nothing of practical moment, and the tree of research must be judged by its fruits. Equally fruitless has been the research into vitamin deficiency in relation to cancer which the report condenses into a sentence. Deficiency, even when pushed to a dangerous degree, appears to exert no marked influence in retarding growth of transplanted tumours in rats, nor does the presence of a tumour accelerate the onset of the symptoms of this deficiency. Local authorities, deeply concerned as they should be with the nutrition of the community, must bear this in mind. Research on cancer metabolism has so far led practically to nothing. No constant or significant differences have been discovered in the absorption and utilisation of the materials necessary to bodily existence between normal and cancerous animals. Rapidly growing malignant growths may contain a higher proportion of potassium salts and a lower calcium content than corresponding normal tissues, but this feature is not really distinctive, as it is shared by young and embryonic tissues. Here the finding of long and patient research is still quite negative.

But the positive achievement is very definite and not difficult to set out clearly. It has certainly never been so well set out as in this memorandum. Here the year 1915 is memorable; for although under Virchow's inspiration, Tiersch, Waldheim, Diakon, and others had already brought together data in support of the irritation theory of cancer, it was not until 1915 that it became possible by the continued application of tar and other substances to induce the formation of a growth displaying the two typical features of cancer—namely, unlimited power of multiplication and ability to form metastases. This conception has positive results to record; it has been a fruitful conception. The production of cancer in animals by repeated application of tar, based largely on the work of Tsutsui, and of Fibiger and Bang in the mouse, is the most important of these practical results. All animals are not equally susceptible, and while simple tar may initiate true skin cancer in three to four months in a few mice out of a large number, in the majority six to nine months is necessary; and in some animals, again a few in number, no result may be obtained, although tarring be continued for 18 months. Since mice die of old age at about 2 years, irritation to be effective has to be continued through a proportion of their life which corresponds to 20 or 30 years in man—a suggestion which is fully borne out by such accurate human experience as exists, notably that of Dr. A. Scott, of Broxburn, in the Scottish paraffin industry. If tarring be discontinued after three to four months, the cancer develops after a latent period which may be shortened if another form of injury—namely, scarification, is combined with tarring. How close is the analogy between this finding and the association in man of cancer of the tongue with rough tooth-stumps, smoking, and syphilis. Attempts to identify chemically the substance in tar which induces cancer have not yet been successful, beyond its limitation to the fraction boiling at 300°–350° C. It may not be a simple body; arsenious acid is the only pure substance which has so far been used with success as a cancer-producing irritant. The rôle of chemical irritation in the production of cancer has now become very plain indeed, for although two forms of malignant new growth in the rat are constantly associated with the presence of parasites, repeated injection of dried parasites does not produce new growth, and the belief is well founded that it is not the mechanical irritation of the parasite, but the long-continued application of substances excreted by the parasites which is responsible for the result. The local authority, to whom this pamphlet is addressed, will recall the sweep and the mule-spinner in relation to chemical irritation. Another striking fact is the observation that the existence of a cancer produced by tarring or arising spontaneously in a mouse prevents the production of a second malignant tumour by tarring, showing particularly clearly that a tumour produces some alteration in the whole body of the animal in which it is growing.

One fragment of knowledge lies perplexingly on the border-line of the positive and the negative. The infective sarcomata of the domestic fowl, discovered by P. Rous, appear to be transmissible without the intervention of intact cells, and thus to be out of harmony with all other experimental cancer work. The question is raised in the memorandum whether these tumours, if completely freed from a filtrable virus, could still behave as malignant new growths when introduced into the bodies of susceptible animals. If not, they may in reality be in the nature of granulomata dependent for their continued proliferation on the persistence and multiplication of the infecting organism. Here is a question worthy of further investigation. The memorandum will be of special service to those who are surveying experimental cancer investigation as a whole, and considering the directions, new and old, in which particular researches require to be initiated or continued. It is a most valuable memorandum, and wise investigators will realise that the studious calm of its authors in no way belittles the value of their work. For in truth the document is one testimonial to their qualities of patience and perseverance.

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and towns of Sweden. These investigations do not necessarily invalidate the observations of bacteriologists who have found the bovine tubercle bacillus in a goodly proportion of cases of fatal tuberculosis in childhood. But Dr. Lichtenstein's work is an important addition to the mass of evidence which has accumulated during the last few years, and which points unequivocally to the conclusion that man is the most dangerous source of infection, and that strains of tubercle bacilli not conforming to the characteristic properties of the human type of tubercle bacillus play a comparatively unimportant part in the tuberculosis of man.

A FRENCH HISTORY OF MEDICINE.

THE French have always been in the forefront of the army of writers on the history of medicine. Daniel Le Clerc's "Histoire de Médecine" was published in 1702; he was practically a contemporary of our own Dr. John Freind, physician and politician, who brought out his History of Physick from the time of Galen in 1725; while in more modern times we have N. L. Leclerc, whose excellent "Histoire de la Médecine Arabe" appeared in 1876. Dr. L. Meunier is a worthy follower[1] of his eminent countrymen, and we agree with Prof. Ballet, President of the Société Française d'Histoire de la Médecine, who says in his preface :—

> "For a work upon the history of medicine to find acceptance among medical men who are not indifferent to things of long ago, but who have only little leisure to give to their study, it is necessary for the book to be complete without being too long, without obscurity though of necessity condensed, and without neglecting essentials it should glide lightly over many matters of secondary interest which serve to show up in relief those which really make up the important links of tradition. Such a task is difficult to accomplish, but in my opinion Dr. Meunier may be said to have succeeded as far as is possible."

In a work of only some 600 octavo pages, which covers the whole period from Hippocrates to the end of the nineteenth century, it is impossible to mention everything that might be mentioned, but we have noted one or two places where we think that Dr. Meunier might have added to his facts. For instance, in his fifth book, where he is referring to the editions and translations made at the Renaissance of the works of Hippocrates and Galen, he says that previously all the translations had been made into Latin from an Arabic version. But Hippocrates and Galen had been translated certainly in part and possibly in their entirety in the sixth century, according to Cassiodorus who, in the instructions which he compiled for the use of the monks in his monastery called Vivaria, says:—

> "Quod si vobis non fuerit Graecarum litterarum nota facundia . . . . legite Hippocratem atque Galenum latina lingua conversos id est Therapeutica Galeni . . . . et Hippocratis de Herbis et curis."

It is not quite clear whether the two treatises mentioned by Cassiodorus were the only ones translated, or the only ones which he wanted the monks to read, and we have been unable to find any reference in the Loeb Library to a Hippocratic treatise with a title in Greek corresponding to De Herbis et Curis. Again, when talking of the eighteenth century, Dr. Meunier remarks that John Hunter treated aneurysms by opening the sac and ligation of the vessel above and below, but he makes no mention of the true Hunterian operation, one of the greatest advances in surgery, of tying the vessel at a distance from the aneurysm so as to apply the ligature at a healthy part. We think, too, that in the section on pathogenic microbes, p. 501 et seq., a little more might have been said of Lister's patient and toilsome researches than that "Lister, from about 1869, without any full understanding of the microbic complications of operation wounds, promulgates his system of antiseptic dressings with satisfactory results from now onwards." These, however, are but slight blemishes in an admirable book, and we congratulate both Dr. Meunier and the French Society of the History of Medicine upon its appearance.

THE PATHOGENESIS OF CARDIAC ASTHMA.

THE results of a series of investigations undertaken with a view to explaining the pathogenesis of cardiac asthma are recorded in an important work[1] recently published in Vienna. Having reviewed the clinical picture of this well-known syndrome, the authors conclude, from a survey of the investigations dealing with the subject, that a theory has not been developed which can satisfactorily explain the breathlessness and pulmonary œdema of cardiac asthma. The speed with which the blood flows towards the heart may in a rough way be estimated by observing the flow of blood in a superficial vein of the arm, which has first been emptied by stripping with the finger the vessels in a peripheral direction, and at the same time obstructing the flow at the central end. It was found in many cases of cardiac asthma, by this simple method of examination, that the speed with which the blood flowed through the emptied vein was much increased as compared with a normal subject. If these observations could be confirmed by some exact method of estimating the speed with which the blood flows we should be justified in concluding that the œdema of the lungs in cardiac asthma was due to the failure of the left ventricle to maintain the circulation, and that this was brought about by the sudden increase in the speed with which the blood reaches the right auricle.

Three methods were employed to investigate the blood flow in the patients upon whom observations were being made: (1) the plethysmographic method, a volumetric method by which it is possible to estimate the flow of blood through an extremity in a unit of time; (2) the blood method, which depends upon the difference in the oxygen content of the arterial and venous blood; (3) the gas method, which is the most accurate method of estimating the true minute volume. By employing the last method it is possible to determine the difference in the oxygen content of the blood in the right and left sides of the heart. The plethysmographic method employed by these investigators is not a new one. The technique is simple and the apparatus in no way complicated. The forearm, which is always used in this experiment, is covered with a glove and enclosed in a water-containing receptacle; by means of a Riva-Rocci sphygmomanometer venous stasis is produced in the limb and a rise or fall in volume is recorded on a revolving drum. The time required for the plethysmographic curve to rise after obstructing the venous flow in the limb is taken as an index of the speed with which the blood flows in the superficial veins of the body. The Austrian investigators find that the blood flow towards the heart is quickened by heating the water and retarded when the temperature of the water has been lowered. The plethysmographic curve is a slow-rising one in patients with high blood pressure. In the patient with exophthalmic goitre the rise is a rapid one; in the case with myxœdema, on the other hand, there is little or no rise, depending upon the temperature of the limb. In the patient with cardiac asthma, if the observation is made during the attack, there may be a perpendicular rise of the curve the instant venous stasis is produced, so rapid is the blood flow towards the heart at this time. It is the rule for the curve to rise rapidly in these cases during the attacks, or shortly before. One curve recorded during an attack is given showing no real increase in the blood flow. To confirm the results obtained by the plethysmographic method the oxygen content of from the appearance of which it is impossible to incriminate any particular one. Here, perhaps, the actual cause of the eruption is not the drug itself, but some toxic substance produced by its action on the tissues. Certain drugs, however, may evoke eruptions as specific as those of the eruptive fevers or of the well-defined dermatoses—for example, the halogens, and, above all, antipyrine. These specific forms of cutaneous reaction provide one of the most fascinating problems not only for the clinical dermatologist but also for the physiologist and biochemist. To take a single example, we may cite pityriasis rosea, one typical lesion of which is sufficient for an expert to make a certain diagnosis; that this disease is due to an unknown infective organism is certain, but what are the factors on which the peculiar configuration of the type-lesion and the characteristic distribution of the eruption depend? The morbid histology of the eruptive elements does not help us.

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[1] Histoire de la Médecine; depuis ses origines jusqu'à nos Jours. Par le Dr. L. Meunier. Preface par le Prof. Gilbert Ballet. Paris: Librairie E. Le François. 1924. Pp. 642. Fr.30.

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At present we can but recognise that, among the great variety of cutaneous reactions, some, such as certain forms of erythema, urticaria, and eczema, are non-specific, and these may be due not to the direct action on the skin of the various toxins that provoke them, but to substances produced by the poisonous action of the toxins on the tissues; on the other hand, other reactions are absolutely specific for a given toxin, and it is on the variety of these specific reactions that the differential diagnosis of skin diseases largely depends. We can recognise clinically the special characteristics of this or that eruption, and in many cases a diagnosis can be made from a microscopical section, but at present we are absolutely ignorant of the physical and chemical processes that determine the specific differences in these cuti-reactions. It seems to us that light might be thrown on this problem by further research along the lines adopted by Lewis and Grant in their recent experiments.

Annotations.

"Ne quid nimis."

SOCIAL SERVICES IN HOSPITALS.

The report of the Institute of Hospital Almoners for the year 1923 gives an encouraging account of this branch of social service. The income and expenditure account shows a small balance on the right side. During the year 11 students completed the course of training required and received the certificate of the Institute, eight almoners and four assistant almoners trained by the Institute were appointed to various hospitals, 18 candidates were accepted for training, and a fund for scholarships was placed at the disposal of the Institute. It is no light task in these days to administer a social service department of a hospital successfully. Old landmarks have disappeared and a new generation has arisen with new needs and insistent demands. Adaptability to these new needs is essential; the housing problem, parental responsibility, industrial fatigue, the psychology of the worker, these and many other matters come from time to time "within the terms of reference" of the hospital almoner. The report of the social service department of St. Thomas's Hospital for 1923 brings these points into focus from a wide angle. As the report shows, the voluntary hospital is gradually opening its doors to a larger public, highly specialised forms of treatment beyond the scope of the general practitioner tend to increase in number and complexity, special inquiries, such as the one now proceeding in chorea and rheumatism, are opening up new fields of research, the after-care of cancer patients has become more and more a social necessity, and with all these advances the responsibility of the almoner's department increases proportionately. Added to these new developments the needs for financial inquiry, for which the almoner's departments were originally started years ago, call nowadays for especially careful and wise handling. The "new poor" is no political myth: it is the outward expression of post-war conditions which will remain with us in the voluntary hospitals for many a long day. Although it is obviously impossible to comment on the many problems which confront the social service departments in this connexion, one at least needs reference in passing—viz., the inter-relation of the various State grants and voluntary financial aid. The report of the Almoner's Department of Moorfields Eye Hospital emphasises this point. State assistance has, as yet, by no means covered all the cases requiring help even in so well-regulated a field as ophthalmic work. Moorfields treats numbers of myopic children from districts of the Home Counties outside the L.C.C. area where the special education accorded to London children is impossible to obtain owing to the scattered nature of some of the county districts. In such cases there is often no choice between an ordinary elementary school and a resident school for the blind, and coöperation with the hospital social service department is needed to bridge the gap. Another instance of the dovetailing of voluntary effort and State assistance is supplied in the condition of patients who lose their sight between the ages of 35 and 50. These unfortunate patients are too old for training in workshops or other institutions under the education authorities, and too young for the State pensions for the blind, whilst the pensions of the various voluntary organisations are too few to meet the circumstances. In these days it is obvious that patient and social worker alike need the "infection of a good courage."

A GEOGRAPHICAL SURVEY OF HUMAN AND BOVINE TUBERCULOSIS.

In the United States of America the recent rapid decline in the incidence of surgical tuberculosis in childhood has been correlated by some authorities with the wholesale pasteurisation of milk which has been in force for some years in certain towns. It is very doubtful if this deduction is correct, for in certain Norwegian towns the incidence of tuberculosis in childhood has also fallen with dramatic speed during the last few years, although the milk-supply of these towns is not pasteurised. We may not yet be in a position to appraise accurately the importance of the bovine tubercle bacillus in the generation of human tuberculosis, but a recent statistical survey, published by Dr. A. Lichtenstein in *Acta Pædiatrica* for June 16th, would suggest that we may in the past have much overrated the importance of bovine tuberculosis as a source of infection to man. Dr. Lichtenstein investigated the incidence of fatal tuberculosis among children 1 year old and 5 years old in the towns and counties of Sweden, comparing the figures thus obtained with the figures showing the incidence of bovine tuberculosis throughout the country. No connexion whatever could be found between the two series of figures. In the north of Sweden, for example, bovine tuberculosis proved to be practically non-existent, whereas the death-rate from tuberculosis among children was exceptionally high. Dr. Lichtenstein classified the 24 counties of Sweden according to the frequency of bovine tuberculosis, and he found that the 12 worst counties in this respect showed an average incidence of 13·8 cases of tubercle per 10,000 head of cattle, whereas the corresponding figure for the 12 counties with the lowest rate of bovine tuberculosis was only 2·7 per 10,000. In the first group the death-rate from tuberculosis among children under the age of 5 was 14·8 per 10,000, and in the second group it was 12·7 per 10,000. The difference between the human rates was thus very slight in the two groups of counties, although bovine tuberculosis was five times more common in one group than in the other. Dr. Lichtenstein has also compared the death-rate from tuberculosis among children under the age of 5 with the death-rate from tuberculosis at all ages in man, and has found that these two rates run parallel to a remarkable degree in the different counties and towns of Sweden. These investigations do not necessarily invalidate the observations of bacteriologists who have found the bovine tubercle bacillus in a goodly proportion of cases of fatal tuberculosis in childhood. But Dr. Lichtenstein's work is an important addition to the mass of evidence which has accumulated during the last few years, and which points unequivocally to the conclusion that man is the most dangerous source of infection, and that strains of tubercle bacilli not conforming to the characteristic properties of the human type of tubercle bacillus play a comparatively unimportant part in the tuberculosis of man.

A FRENCH HISTORY OF MEDICINE.

THE French have always been in the forefront of the army of writers on the history of medicine. Daniel Le Clerc's "Histoire de Médecine" was published in 1702; he was practically a contemporary of our own Dr. John Freind, physician and politician, who brought out his History of Physick from the time of Galen in 1725; while in more modern times we have N. L. Leclerc, whose excellent "Histoire de la Médecine Arabe" appeared in 1876. Dr. L. Meunier is a worthy follower[1] of his eminent countrymen, and we agree with Prof. Ballet, President of the Société Française d'Histoire de la Médecine, who says in his preface :—

> "For a work upon the history of medicine to find acceptance among medical men who are not indifferent to things of long ago, but who have only little leisure to give to their study, it is necessary for the book to be complete without being too long, without obscurity though of necessity condensed, and without neglecting essentials it should glide lightly over many matters of secondary interest which serve to show up in relief those which really make up the important links of tradition. Such a task is difficult to accomplish, but in my opinion Dr. Meunier may be said to have succeeded as far as is possible."

In a work of only some 600 octavo pages, which covers the whole period from Hippocrates to the end of the nineteenth century, it is impossible to mention everything that might be mentioned, but we have noted one or two places where we think that Dr. Meunier might have added to his facts. For instance, in his fifth book, where he is referring to the editions and translations made at the Renaissance of the works of Hippocrates and Galen, he says that previously all the translations had been made into Latin from an Arabic version. But Hippocrates and Galen had been translated certainly in part and possibly in their entirety in the sixth century, according to Cassiodorus who, in the instructions which he compiled for the use of the monks in his monastery called Vivaria, says :—

> "Quod si vobis non fuerit Graecarum litterarum nota facundia . . . . legite Hippocratem atque Galenum latina lingua conversos id est Therapeutica Galeni . . . . et Hippocratis de Herbis et curis."

It is not quite clear whether the two treatises mentioned by Cassiodorus were the only ones translated, or the only ones which he wanted the monks to read, and we have been unable to find any reference in the Loeb Library to a Hippocratic treatise with a title in Greek corresponding to De Herbis et Curis. Again, when talking of the eighteenth century, Dr. Meunier remarks that John Hunter treated aneurysms by opening the sac and ligation of the vessel above and below, but he makes no mention of the true Hunterian operation, one of the greatest advances in surgery, of tying the vessel at a distance from the aneurysm so as to apply the ligature at a healthy part. We think, too, that in the section on pathogenic microbes, p. 504 et seq., a little more might have been said of Lister's patient and toilsome researches than that "Lister, from about 1869, without any full understanding of the microbic complications of operation wounds, promulgates his system of antiseptic dressings with satisfactory results from now onwards." These, however, are but slight blemishes in an admirable book, and we congratulate both Dr. Meunier and the French Society of the History of Medicine upon its appearance.

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Three methods were employed to investigate the blood flow in the patients upon whom observations were being made: (1) the plethysmographic method, a volumetric method by which it is possible to estimate the flow of blood through an extremity in a unit of time; (2) the blood method, which depends upon the difference in the oxygen content of the arterial and venous blood; (3) the gas method, which is the most accurate method of estimating the true minute volume. By employing the last method it is possible to determine the difference in the oxygen content of the blood in the right and left sides of the heart. The plethysmographic method employed by these investigators is not a new one. The technique is simple and the apparatus in no way complicated. The forearm, which is always used in this experiment, is covered with a glove and enclosed in a water-containing receptacle; by means of a Riva-Rocci sphygmomanometer venous stasis is produced in the limb and a rise or fall in volume is recorded on a revolving drum. The time required for the plethysmographic curve to rise after obstructing the venous flow in the limb is taken as an index of the speed with which the blood flows in the superficial veins of the body. The Austrian investigators find that the blood flow towards the heart is quickened by heating the water and retarded when the temperature of the water has been lowered. The plethysmographic curve is a slow-rising one in patients with high blood pressure. In the patient with exophthalmic goitre the rise is a rapid one; in the case with myxœdema, on the other hand, there is little or no rise, depending upon the temperature of the limb. In the patient with cardiac asthma, if the observation is made during the attack, there may be a perpendicular rise of the curve the instant venous stasis is produced, so rapid is the blood flow towards the heart at this time. It is the rule for the curve to rise rapidly in these cases during the attacks, or shortly before. One curve recorded during an attack is given showing no real increase in the blood flow. To confirm the results obtained by the plethysmographic method the oxygen content of the arterial and venous blood was estimated in a similar group of cases. When the blood flow is rapid the difference in the oxygen saturation of the arterial and venous blood should be slight. The observations recorded confirm the results obtained by the plethysmographic method. It is noted that in some the venous blood has a bright red colour and this is attributed to the rapid flow of blood through the capillaries. Observations on the effect of pilocarpin, morphia, adrenalin, and amyl nitrite on the blood flow, determined in this way, are of pharmacological interest and offer a possible explanation of the effect of these drugs in cardiac asthma. These observations and others, based on the recording of the venous pulse in the arms—the so-called penetrating venous pulse—support the view that in the arms the speed of blood flow from the arteries to the veins is altered by heat, cold, rise of blood pressure, certain drugs, and that nervous influences play an important rôle in producing this change.

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Further evidence will be necessary if this theory of the pathogenesis of cardiac asthma is to be accepted, for the observations so far have been limited to a study of the blood flow in the arm. An analysis of the true minute volume of the blood—i.e., the volume of blood flowing through the heart in a unit of time—should confirm the results obtained from the plethysmographic and blood methods of estimating blood flow. It was found, in the control cases, that the normal values when the gas method was employed varied between quite wide limits, but that it was possible to conclude from the results in the heart cases that the breathlessness and pulmonary œdema in the patient with cardiac asthma are due to the overloading of the right side of the heart with failure of the left ventricle, brought about by the increase in the volume of blood flowing into the auricles in a unit of time. This very interesting study of the peripheral circulation has advanced our knowledge of a subject which is occupying the minds of many engaged in cardio-vascular research.

INDUSTRIAL SMOKE ABATEMENT.

IN our issue of last week[1] we referred briefly to the efforts now being made in Halifax to prevent excessive smoke from the factory chimneys. Mr. H. G. Clinch, chief smoke inspector, tells us in the annual health report that since the end of 1922 an entirely new procedure has been adopted in dealing with dirty chimneys. Before that date observations were taken at intervals, and in case of excessive emission of black smoke statutory notices were served and prosecutions followed in the event of non-compliance. The present method is to provide owners of boiler plants with technical advice, to prove to them the economy of smokeless combustion, hoping by so doing to obtain coöperation, only using legal proceedings as a last resource. Much trouble is given to the careful inspection of boiler plants, and to the study of the fuel and methods of firing in order to locate the cause of faulty combustion. At first engineering proposals emanating from the health department were regarded with suspicion, but as a result of patient explanation of the principles involved, confidence has been established and owners are now pleased to know that their boiler plants are under supervision. In the past firms have been surprisingly careless of the way in which their coal was used, and cheerfully footed a coal bill amounting to thousands of pounds per annum without ascertaining first the calorific value of the coal used, and secondly, what proportion of this value was being recovered in steam. Sometimes it has been found that 30 per cent. of the heating value of the coal was being wasted through sheer carelessness or ignorance. In one instance an avoidable waste of £1150 per annum from a two-boiler plant was disclosed. Mr. Clinch points out that more coal is probably used in the boiler furnaces than in the houses of Halifax, so that the present campaign is gradually ridding the town of preventable smoke. As a further proof of the guilt of the factory chimneys, he contrasts the blue haze every Sunday, when the domestic chimney is producing its maximum output, with the dismal gloom of the week-days, when the factory chimneys are busy. During 1923 290 observations of factory chimneys for one hour gave an average of 1·9 minutes of dense black smoke. It seems, also, from Mr. Clinch's report that instruments for enabling a reliable estimate to be formed of furnace efficiency are not yet satisfactory, and he thinks that a wall type temperature indicator, showing the heat of the gases in the downtake of every boiler, would be of greater assistance to the fireman than the combustion indicators at present in use, which only warn him of the presence of excess air and tell him nothing about insufficient air. The fireman needs an indicator showing what heat he is actually producing. Mr. Clinch quotes some 15 typical examples showing how cases of faulty combustion were dealt with during the year. Lectures have been delivered at the Workmen's Club to boiler attendants and firemen. Mr. Clinch is most optimistic as to the results of the new system and foresees the time when every manufacturer in Halifax will be his own smoke inspector. It is to be hoped that the example of Halifax will be followed by other factory towns.

DEVELOPMENT OF THE VAGINA.

AT the recent summer meeting at Sheffield of the Anatomical Society Dr. R. N. Burkitt described the conditions in a case in which the vagina was absent, but in which there was reason to suppose that the uterus was present and capable of menstruation. Prof. J. E. Frazer, at the same meeting, showed a specimen in which there were two vaginæ opening in a single normal vulva, each vagina leading to a separate half-uterus, with a normal tube and elongated ovary; a ruptured follicle was present in each ovary. A median septum extended from bladder to rectum, between the two uteri. Those who believe that normal development, as we know it now, will not explain such abnormalities, and those who look to the study of normal development for their explanation were represented in the discussion over these specimens. The two views seem to be at direct variance, but really they are similar views, seen, perhaps, from slightly different angles. The first of the two schools of opinion mentioned above holds that details of organogenetic formation are of little use in fundamental abnormalities, and that inquiry must be pushed back to the causes lying under the lines of development. The second group holds that further research into development will explain such cases, but the only parts of normal organogeny about which we do not know anything are the early and primary parts, in which the form and line of development is laid down. Thus the two groups are really suggesting research in the same direction as the way to find explanation for these large abnormalities. In the particular case of the female pelvic organs, however, there is reason to call for decisive investigation into the actual facts of later formation. Clinicians and pathologists are aware that there are at least two main views in the field about the development of the vagina, to take this organ alone, and there is a tendency to choose one view as more likely than the other, because it seems to fit in with certain aspects of disease. The older view derives the vagina from the Müllerian ducts. This origin is altered at a later stage, according to the second view, by secondary down-growths to form the vagina, the older structure being lost. This secondary alteration of the original state, however, is without proof and demonstration, so far, although it must be confessed that it would fit in, not only with the explanation of cases such as those shown at Sheffield—and with many other pathological conditions—but also with certain facts in comparative anatomy. Nevertheless, it seems only right to point out that this view, however alluring, is at present an unproved assumption, and that there is need for further research into the very important questions concerned.

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[1] THE LANCET, August 2nd, p. 240.

CASUALTIES AT WEMBLEY.

SINCE the opening of the British Empire Exhibition in April the medical services, of which we gave an account in THE LANCET of May 31st (p. 1127), have dealt, through the Main Ambulance Station, with over 11,000 casualties occurring in the Exhibition grounds. The cases have been very varied in character and severity, which is to be expected in a community with a changing daily population of between one and three hundred and fifty thousand, and although the majority of the 11,000 cases were trivial, some 300 of these must be classed otherwise. Amongst the latter were the following: gastro-enteritis, 87 (all in one day[1]); fractures, 12; dislocations, 5; perforated duodenal ulcer, 5; appendicitis, 4. The fractures consisted of three of the shaft and one of the neck of the femur, and one of the lower end of the ulna through falling on the hypothenar eminence of the hand, but no fracture was the result of any accident in the Amusement Park. The dislocations were three of the shoulder, all reduced, and patients sent home; and one of the terminal phalanx of the great toe backwards. Among the less serious cases with which the main ambulance station has to deal must be mentioned those persons, old and young, who fall into the lake, and though little harm is done they must be put to bed while their clothes are drying. It was found necessary to accommodate batches of ex-soldier paraplegics for the relief of urinary difficulties. The Amusement Park provides occasional accidents, but few are other than slight, and the menagerie there supplies its quota of wounds from "twisting the lion's tail"—the retaliatory defensive measures of irate bears, monkeys, and other animals. Fatigue auto-intoxication is a common complaint amongst elderly folk and children, following long journeys, frequently undertaken at night with little rest or sleep, combined with unsuitable and irregular meals. They require rest in bed and dieting, and they get both. Headaches require relief and are due to the same cause; aspirin is a sheet anchor and is in frequent demand. Aged men with prostatic trouble, ofttimes leading to distension with overflow, require catheterisation, and elderly females with colotomies or pessary displacements wish re-adjustments. Railway and char-a-banc excursionists with abdominal colic from general over-repletion seek anodynes. When it is stated that over 84,000 ices were sold one day in the Exhibition this is not surprising, as there can be no limitation, except the pocket, to individual desire or capacity. Epileptics and hysterics respectively demand bromides and sympathy. Four midwifery cases are recorded, one in which the woman was in the sixth month of pregnancy and three of premature labour. No case of acute alcoholism has required treatment, and the stomach-pump has found no employment for this purpose. There have been only two deaths since the Exhibition was opened to the public, one the case of an employed workman who died of heart failure and the other through an accident to an employee on Monday last. The four ambulance stations are staffed by men and women belonging to the Order of St. John of Jerusalem and to the British Red Cross Society, and the average daily number of the staff for first-aid work is 95. The nursing staff is supervised by a visiting matron, a sister, and a qualified nurse from the Willesden General Hospital, who are aided by from two to four V.A.D.'s specially chosen on account of their experience. The work of the first-aid nursing staff is deserving of high praise, as it is practically honorary, the members of the two great ambulance societies receiving the purely nominal wage of half-a-crown per day.

HEALTH SERVICES IN MILNROW DISTRICT.

THE attention of the Minister of Health was recently drawn in the House of Commons to the annual report for 1922 of the medical officer of health for the Milnrow district. In this report it was stated that the death-rate was 21·5, or 7·3 higher than in 1921; that infantile mortality was at the rate of 190 per 1000 births; that the smoke nuisance was very bad; and that a more rapid conversion of the sanitary system of water carriage was required. The Minister was asked whether he was aware that the local authority had done nothing in the way of providing working-class houses; that there was no child welfare centre and no district nurse; and that the sanitary inspector had to give most of his time to collecting rates, collecting rents of council houses, and collecting electricity accounts. The Minister replied that representations had already been made to the urban district council with regard to certain matters, and that should the report of the medical officer of health for 1923 reveal no evidence of improved conditions, he proposed to arrange for an inquiry to be held into the sanitary administration of the district. He added that 54 houses were erected by the local authority under the State assisted scheme authorised by the Housing, Town Planning, &c., Act, 1919, and that the council had adopted a scheme for the assistance of private builders under the Housing, &c., Act, 1923.

The report for 1923 has just reached us, and in this Dr. John Chadwick, the medical officer of health, points out that it is the best report which he has yet been able to put before the council, whereas that of 1922 was the worst. There is a gratifying increase in the birth-rate, while the general death-rate from zymotic diseases, the tuberculosis rate, and the infantile mortality-rate are all very much lower, in fact, form a record. Dr. Chadwick observes, as a matter of common experience, that in small districts the vital statistics are apt to vary very greatly from year to year and that the real state of affairs is shown by the average figures for a term of years. These show a satisfactory improvement in Milnrow and indicate that steady and sustained efforts to improve the sanitary conditions of the district are producing the desired results. The death-rate for 1923 was 11·5—the lowest ever recorded in Milnrow—as against 21·5 for 1922. The death-rate for England and Wales for 1923 was 11·6. In 1922 there were 69 cases of scarlet fever with no deaths, as against six cases in 1923. There has only been one death from scarlet fever during the last 12 years. The infantile mortality-rate for 1923 was 50, as against 190 in 1922. There is no marked improvement in the black smoke nuisance. Only four houses—private enterprise—were erected during the year and none were built by the council. Of pail closets, 119 were converted to the water-carriage system during the year. On May 10th, 1923, an inspector from the Ministry of Health investigated the steps being taken to remedy the smoke nuisance. But in spite of the general improvement noted this year, upon which congratulations are due to Dr. Chadwick and his authority, constant vigilance and strenuous effort are still required if this urban district is to reach a high standard of sanitary administration and maintain it.

THE ORAL ADMINISTRATION OF TYPHOID VACCINE.

AT a recent meeting of the Academy of Medicine of Paris Dr. A. Gauthier,[1] who had previously made a communication before the same company on the prophylaxis and treatment of bacillary dysentery by oral administration of the specific vaccine, reported on his experience of this method with typhoid vaccine for prophylactic purposes. The vaccines used were fluid vaccine, Lumière's entero-vaccine, and bili-vaccine. Among 1210 persons who were given the bili-vaccine between May and December, 1923, at Athens and Salonica, not a single case of typhoid developed. Although typhoid is endemic in these two regions Dr. Gauthier did not feel justified in concluding that these results were a proof of the immunising value of buccal vaccination. He therefore determined to employ the method in a circumscribed area in which there was a considerable epidemic of typhoid. Three Greek villages were chosen for the purpose, one in Attica and two in Eubœa, where a general vaccination of the population was carried out by the oral route. The daily dose was 1 c.cm. for an adult, ½ c.cm. for a child aged 2–6 years, and ¼ c.cm. for a child below 2 years. The dose was repeated for three consecutive days and was taken in a little water on an empty stomach. In the Attica village a severe epidemic was brought to an end suddenly and completely, since only one case of typhoid subsequently occurred, and that during the negative phase seven days after administration of the vaccine, in spite of the fact that the source of contagion continued to exist, no measures having been taken to purify the infected water-supply. In the two Eubœan villages only four cases of typhoid occurred after the vaccinations, all during the negative phases, and the epidemic came completely to an end. Encouraging as these results are, Dr. Gauthier is of opinion that the period of trial of this method is not yet terminated. If the value of the method is confirmed by subsequent experience a considerable advance will be made, since it is undeniable that the fear of hypodermic injection and of the consequent reaction, slight as it is, deters the civilian population in various countries from submitting to antityphoid inoculation. At a subsequent meeting of the Academy of Medicine, Dr. C. Achard and Dr. S. Bloch,[2] commenting on Dr. Gauthier's communication, alluded to the encouraging results obtained by Vaillant with oral administration of typhoid vaccine in the Pas de Calais epidemic in 1921, but they seemed to agree with Calmette, who issued a warning against the generalisation of this method in place of injection. They mentioned the case of a nurse who took 28 keratinised pills of entero-vaccine in the prescribed doses in the course of a week, but nevertheless contracted a severe attack of typhoid fever three and a half months later. The complete absence of immunity in her case was probably due to the vaccine not having been absorbed by the mucous membrane. In other cases they gave full doses of typhoid vaccine by mouth (12 c.cm. in the course of 12 days) as well as 5 g. of sulphate of magnesia on the first day to promote a flow of bile into the intestine, but they did not succeed in getting a positive agglutination reaction, although a fixation reaction was obtained at various dates. The fixation reaction may require repeated examinations of the blood, so that in the end oral administration of the vaccine is not simpler than that of injection.

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[1] THE LANCET, June 21st, p. 1280.

[1] Bulletin de l'Académie de Médecine, 1924, xli., 486.

Sir John Rose Bradford has been adopted as the official Conservative candidate in the by-election for the University of London seat rendered vacant by the death of Sir Sydney Russell-Wells.

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[2] Bulletin de l'Académie de Médecine, 1924, xli., 531.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of *June 28th*, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXIII.—THE TREATMENT OF DYSENTERY.

II.—AMŒBIC DYSENTERY.[1]

AN amœbic infection of the intestinal tract gives rise to a great variety of manifestations, and the clinical picture is accordingly considerably less definite than that of bacillary dysentery. Though occurring in both acute and chronic forms, amœbic dysentery is in the majority of cases characterised by a slow and insidious onset and chronic course, with a tendency to occasional exacerbations, during which the patient is acutely ill. The condition often bears a considerable resemblance to that of chronic bacillary dysentery, and a definite diagnosis may be impossible until the presence or absence of amœbæ or their cysts has been determined by the microscopic examination of the stools—an examination which, in the event of negative findings, must be repeated several times before an amœbic infection can be regarded as definitely excluded. Unlike the chronic bacillary form, there may be in amœbic dysentery long intervals, during which all symptoms may disappear, and a state of fair health seems to be established—a circumstance which needs to be borne in mind in assessing the value of any special line of treatment. The occurrence of hepatic abscess or acute hepatitis in the course of chronic dysentery amounts to practical proof of an amœbic infection.

The general management of a case of amœbic dysentery must be regulated by the severity of the symptoms. During the acute phases, characterised by diarrhœa with frequent loose stools containing mucus and blood, the patient should be kept in bed and placed on a strictly fluid diet. There is not the same objection to milk as in acute bacillary dysentery, and it may be given freely. In the absence of acute symptoms it is seldom necessary to confine the patient to bed, though every form of active exertion should be forbidden; nor is it desirable to restrict the diet to fluids, provided that articles of food which are likely to pass through the intestine in undigested form and cause irritation of the lower bowel are avoided. Constipation is often present, and is best corrected by the use of salines.

The pathological diagnosis of an amœbic infection should be at once followed by one or more courses of treatment with emetine, which is a specific remedy for amœbic dysentery in a similar sense to that in which quinine is a specific remedy for malaria. The chief value of emetine lies in its remarkable controlling influence over the more acute manifestations of the disease; as a means of cure in the sense of the complete eradication of the parasites its efficacy is less striking, and failure is not uncommon. Nevertheless, we possess no remedy more potent for the control of amœbiasis, and the pathological diagnosis of an amœbic infection should be followed as a matter of routine by one or more full courses of treatment. A course consists of 12 days' treatment, during which either (*a*) emetine hydrochloride gr. ⅔ are given hypodermically twice daily; or (*b*) gr. 1 is given by mouth, supplemented by gr. ½ hypodermically each day; or (*c*) bismuth-emetine-iodide gr. 3 are given daily by mouth in salol-coated capsules. The result of the treatment must be checked, not only by observing its clinical effects, which in acute cases are often very striking, but by *repeated examinations of the stools* for amœbæ and cysts. A single course seldom effects a cure; when more than one course is required there are advantages in varying the method of administration, and the order given above may conveniently be followed, reserving bismuth-emetine-iodide for the more chronic and intractable cases. It is desirable that, during treatment with emetine, the patient be kept in bed, however slight his symptoms may be, as in these large doses the drug has a definitely depressing action on the heart, which should therefore be spared as far as possible. While taking emetine by the mouth, the patient is given a simple semi-fluid diet, and should be kept strictly at rest for some time both before and after the daily dose, which may conveniently be given an hour after the last meal. Vomiting seldom gives trouble under conditions of absolute repose; if necessary a draught containing 10 minims of tincture of opium may be given half an hour before the dose of emetine. Slight nausea is not unwelcome as a proof that the drug is being absorbed. In a large number of cases it will prove impossible to bring about the complete disappearance of cysts, even by repeated courses of emetine, so long as the patient remains in a hot climate; under more temperate climatic conditions treatment can be resumed with more hopes of permanent success.

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[1] The Treatment of Bacillary Dysentery was dealt with in THE LANCET last week.

In dealing with specially resistant forms a trial may be given to the method of combined administration of emetine with neosalvarsan or novarsenobillon; the dose of the arsenical preparation is 0·3 g. or 0·4 g. given intravenously once a week. This method has been employed in a number of cases by Brug and others, and favourable results are reported.

Enemata of quinine, in increasing strength from 1 in 5000 to 1 in 1000, have been largely used in the treatment of chronic relapsing cases, and are undoubtedly effective in destroying large numbers of the organisms which lie loose in the intestinal secretions or on the surface of the mucosa; it is, however, very unlikely that they are of any avail against cysts or amœbæ embedded in the substance of the mucous membrane; and though they may have their use as adjuvants, injections of quinine solution into the bowel must be regarded as ranking far below emetine in their parasitic-destroying properties. In giving any kind of enema, it is of the greatest importance to bear in mind the necessity for the utmost gentleness in manipulation in order to avoid the risk of perforation.

Acute Hepatitis.

The advent of acute hepatitis is indicated by pyrexia, with pain over the liver, which on examination is found to be enlarged and tender. A course of emetine in full doses should be inaugurated with the least possible delay, as there is reason for believing that by this means the condition may be brought under control and the formation of an abscess prevented. The onset of suppuration may be marked by no special symptoms: but more usually there are repeated rigors and a further rise of temperature, with a rapid deterioration in the general condition of the patient. The earliest local signs of hepatic abscess are often to be found at the right pulmonary base, and are due to the pressure effects of the abscess in an upward direction, causing partial collapse of the lung; with extension of the inflammatory process there may also be a pleural rub or signs of a pleural effusion. When there is reason for supposing that pus has formed, the diagnosis should be confirmed by an exploratory puncture and the pus then removed, either by an open operation or by aspiration. The contents of an amœbic abscess are usually completely free from pyogenic organisms, and hence, in the case of all but very large collections of pus, the method of aspiration is greatly to be preferred, on grounds both of simplicity and efficiency. A Potain's aspirator may conveniently be used, and after removal of the pus 4 or 5 gr. of emetine in solution should be injected into the abscess cavity.

Complications other than those connected with the liver are rare. Perforation may occur, and is occasionally the earliest manifestation of an amœbic infection which, up to the moment of rupture of the intestine, has been completely latent. An immediate laparotomy is indicated. More often perforation is a late event, and considerable difficulty in diagnosis may arise owing to the existence of adhesions and the circumscribed nature of the resulting inflammatory changes. The appropriate surgical treatment must be undertaken at the earliest moment.

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Special Articles.

EXPERIMENTAL CANCER RESEARCH.

FOURTH MEMORANDUM OF DEPARTMENTAL COMMITTEE OF MINISTRY OF HEALTH.

THE fourth[1] of the series of reviews summarising the present position of different cancer problems is concerned with the experimental work on cancer of the last 20 years under two main headings according as each contribution deals primarily with the properties of cells already cancerous or with the way in which cells become cancerous.

I.—THE PROPERTIES OF CELLS ALREADY CANCEROUS.

Transplantability of Animal Cancers.

The observation that cancer cells, when transported by natural agencies within the host, whether man or animal, settled down and continued to multiply in the secondary site led to the investigation of their behaviour when transferred artificially from one animal to another. Hanau (1889) and Morau (1891) were actually the earliest investigators to transplant tumours and obtain fresh growths from these grafts, but the importance of this method was first properly appreciated by Jensen (1902) and Borrel (1903). Their successes with mammary carcinoma (cancer) of the mouse were soon repeated by many others. The important features of this work were the strict limitation to animals of the same species as that providing the primary growth if continuous propagation was to succeed, and the permanence of histological type, rate of growth, and percentage of success, throughout long series of experiments. This showed that the malignant character was inherent in the cancer cells which alone survive transference to the new host. (The only exceptions to this rule of failure in the absence of living cells in the inoculum is formed by the sarcomata of fowls first studied by Rous and later by Fujinami. They are a group apart and will be dealt with in the final paragraphs of this memorandum.) These successful transplantations to normal animals show that it is unnecessary to invoke the hypothesis of an alteration in metabolism (see later section) to explain the continued growth of a cancer; the seed rather than the soil is the factor of primary importance. They do not, however, exclude the possibility of a local metabolic alteration being responsible for the transition of a normal into a cancerous cell.

Immunity or Resistance to Transplantation.

The fact that of ten children born, nine die from causes other than cancer suggested that the majority of persons possessed an attribute somewhat similar in nature to that of resistance to infection by ordinary infectious or bacterial disease, a natural immunity, and experiments were planned to elucidate this, using the method of transplantation, or grafting as it is sometimes called. It was soon found that animals once unsuccessfully inoculated were resistant to a second inoculation, even of considerably more active material, but it was also found that the resistant state could be set up by a preliminary treatment with normal tissues (blood, skin of embryo) provided that intact living cells were used. Killed cells were inactive. The resistant state was only effective against subsequent grafting and had no effect on established tumours. Still more disconcerting was the fact that even the most energetic methods of immunisation had no influence on the progress of primary cancer, as shown by recurrence at the primary site after surgical removal, by the occurrence of growths in secondary sites and by successful grafting of the original tumour in another part of the same animal; these, the most reliable tests of the malignant nature of the growth, were unaffected. This explains the failure of the methods of immunisation (artificial production of resistance) based on the results of grafting of transplantable tumours as a treatment for cancer in man, to which the primary cancers of animals present the closest similarity. None of the hypotheses framed to explain transplanted tumour resistance is entirely satisfactory, and its nature is still obscure.

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[1] Cancer—iv. Circular 516. Ministry of Health. 1924. H.M. Stationery Office. 1d. The three preceding pamphlets were dealt with in THE LANCET, 1923, ii., 479; 1924, i., 770 and 1074.

Cancer Metabolism.

Metabolism, the word used to indicate the series of bio-chemical changes taking place in a living organism in the process of absorption and utilisation of the materials (food, drink, &c.) necessary to its existence, is more active during the period of growth than at other periods. Normal growth being, in essence, due to an orderly multiplication of the cells composing the organism, and cancer being a disorderly growth of some of the cells of the organism, it was hoped that by instituting a comparison between the metabolic processes in normal and cancerous animals some light might be thrown upon the forces at work in the production of cancerous tissue. Much effort has been expended in attempts to discover differences in the energy intake and output of cancer cells by studying the excretions of animals bearing transplanted tumours of such a size that they form a considerable fraction of the total weight of host and tumour together. No constant significant differences have been discovered.

Recently, working on the analogy of the method for the separation of nearly-related bacterial species by their action on various sugars and allied substances, slight but constant differences have been observed between normal and cancerous tissues outside the body. The water content of cancerous tissues has been found to be greater than that of normal tissues and as in growing young individuals, the more rapidly growing tumours are found to have a higher proportion of water. By the methods of gross chemical analysis and by micro-chemical tests malignant growths are found to have a higher proportion of potassium salts and a lower calcium content than the corresponding normal tissues. This feature also is shared by young and embryonic tissues and is therefore not really distinctive.

Vitamin and other Deficiencies and Cancer.

The growth of an animal is thought to be dependent on two factors: (*a*) an internal one, the growth impulse; and (*b*) an external one, the most important constituent of which is food supply.

Among the components of the food supply essential for normal growth are substances known as accessory food factors or vitamins, substances whose chemical nature is not exactly known but which are characterised by the smallness of the amount in which they are consumed proportionately to the effects produced by them. At least three of these vitamins have so far been distinguished and provisionally named, A, B, and C, but probably others exist. Total absence from the diet of one or other of these substances may lead to the occurrence of such diseases as scurvy, rickets, beri-beri (a disease affecting nerve tissues), &c.; relative absence leads to faulty nutrition, some effects of which are imperfectly understood.

The vitamins occur most commonly in green leaves but also in many other foods, and it is probable that any ordinarily varied diet contains an amount sufficient to promote normal growth and development.

Vitamin A (fat-soluble) and vitamin B (water-soluble) are the only accessory food substances which have been studied experimentally in relation to cancer. Neither deficiency, even when pushed to a dangerous degree, appears to exert any marked influence in retarding the growth of transplanted tumours in rats, nor does the presence of a tumour accelerate the onset of the symptoms of these deficiencies. Tryptophane deficiency (produced by making maize meal the only source of protein in the diet) leads to severe and fatal illness in mice and rats. Transplanted tumours grow in animals on this diet, the onset of symptoms and the fatal issue being hastened by the fact that the growing tumour causes more rapid exhaustion of this essential amino-acid.

Results of Tissue Culture outside the Body.

One of the methods used to investigate the process of growth is that known as tissue culture, in which by a specialised technique similar in nature to that used for the cultivation of micro-organisms, and which in essence consists in keeping fragments of tissue in a nutrient medium at a suitable temperature, the multiplication of the cells and the consequent growth of the tissue can be observed.

Burrows, Carrel, Lambert and Hanes and others applied the method of tissue culture to the study of cancer soon after the introduction of the method by Ross Harrison. The first remarkable fact which emerged was that while it was easy to obtain growth of tumours "in vitro" its continuance was much more precarious than in the case of normal tissues. The initiation of artificial culture was the difficulty with the latter. This curious antithesis to the phenomena of propagation in the living animal has only recently been cleared up. It is now known that tumours rapidly produce "in vitro" substances poisonous to themselves, and frequent replacement of the culture medium is necessary if growth is to continue. The toxic substances are innocuous to the growth of normal tissues. With proper precautions, therefore, there is no distinctive limitation to the growth of normal and cancerous tissues "in vitro"; both can apparently grow indefinitely with undiminished speed. The most essential of these conditions for growth is the supply of substances present in watery extracts of embryos of nearly allied species, for without them growth soon comes to a stop.

Embryonic tissues and tumours proliferate immediately on being planted out in a suitable medium, but adult tissues only begin to grow after an initial delay. It has now been shown that this initial period of delay can be cut out by adding to the culture medium the autolysate of normal damaged tissue, that is the fluid resulting from keeping the tissue in a saline medium at body temperature for a limited period. Rapidly growing transplantable tumours extracted in the cold (*i.e.*, without autolysis) give an extract with the same properties. This observation thus brings the malignant new growths into close relation with the processes of repair of tissues following upon injury. It may even provide a method of distinguishing true new growths from rapidly growing tumours due to other causes such as tuberculosis, syphilis, etc.

II.—THE EXPERIMENTAL STUDY OF THE CHANGES BY WHICH CELLS BECOME CANCEROUS.

The work in this direction can be conveniently summarised according to the underlying conceptions on which the various experiments have been based. They fall easily into two groups:—

1.—(*a*) The hypothesis of a microbic origin, in which it was supposed that cancer was due to invasion by a parasitic micro-organism and was therefore of an infective nature.

(*b*) The embryonic hypothesis, in which the conception was that during fœtal life small islands of cells became isolated from their parent tissue and in later life took on an independent form of growth.

(*c*) The gametic hypothesis which, arguing from a pretended resemblance between the method of division of cancer cells and that of the germ cells (which differs from that of all other normal tissues), supposed that cancerous growth depended on the cancer cells having reverted to the type of division peculiar to the sexual cells.

None of the experiments inspired by these hypotheses has led to the production of a new growth of more than a temporary character.

2.—The conception of Virchow that chronic irritation was of great causative importance in the production of cancer.

This latter group is the only one which has positive results to record and the remainder of this summary will be devoted to it. The results achieved will be most conveniently discussed under the headings of the various kinds of irritant employed.

Radiant Energy.

While the skin carcinomata due to intense insolation are well known in man, the only example of experimental production of new growth by radiant energy was the production of sarcomata in rats by X-rays, repeated exposure over about a year being necessary. Recently Bloch has succeeded in producing carcinoma of the rabbit's ear by the same agency after a still longer interval. No such success has followed long-continued repeated exposure to radium, and it is therefore impossible to say whether failure is due to unsuitability of the animals used or to unsuitable dosage.

Animal Parasites.

Occasionally in man, especially in some tropical countries, examples of carcinoma of the bladder are met with supervening on a chronic ulcerative condition due to infection by the eggs of a parasitic worm, *Schistosoma hæmatobium*. Parallel with this two forms of malignant new growth in the rat have been found to be constantly associated with the presence of animal parasites. These parasites are the *Gongylonema neoplasticum* occurring in the stomach of rats (Fibiger) and leading to epithelial overgrowth and carcinoma of the œsophageal end of the stomach. The other parasite is the cystic stage of a tape-worm, *Tænia crassicollis*, in the liver, which frequently sets up sarcomatous growth in the cyst walls.

The intermediate host of the *Gongylonema* (a nematode or round worm) is the American cockroach and these can be infected experimentally by feeding with the fæces of infected rats. Rats in turn are infected by allowing them to eat infected cockroaches. The larvæ encysted in the muscles of the cockroaches are set free in the stomach of the rat. They burrow in the epithelium lining of the stomach and in a certain proportion, which varies with the race of rats employed, carcinoma develops.

The definitive host of *Tænia crassicollis* is the cat, and rats are infected by contaminating their food with the fæces of infected cats. Sarcoma develops in about 50 per cent. of the rats successfully infected. Although cysts in the liver of the rat are usually multiple the sarcomata are usually solitary. The age of the animals does not seem to be of importance in either of these sets of experiments, young animals giving as high percentages of new growth as do old ones. Mechanical irritation by foreign bodies cannot replace these parasites as cancer-producing agents, nor does repeated injection of dried parasites or of extracts of them produce new growth. It is therefore believed that the long-continued application of substances excreted by the parasites is responsible for the result. This conception ranges these experiments along with those in the next group.

Chemical Irritants.

Carcinoma of the bladder has been repeatedly observed in aniline dye workers and the inhalation of minute quantities of aniline vapour has been incriminated, but so far the condition has not been reproduced in animals. Success has attended the experiments made with gas tar, however, and also with extracts of soot. The first experiments were conducted on the ears of rabbits by Yamagiwa and Ichikawa, but the real advantages of the method were only revealed when Tsutsui, and later Fibiger and Bang, turned to the mouse, which has proved to be the material of choice for such experiments. As a matter of fact the rabbit is not a very suitable animal and the rat and guinea-pig have proved to be extremely refractory. Here, again, long-continued repeated applications are necessary, sometimes extending for months, two or three times a week. The area painted need not be large, and the age of the animals has little influence; certainly old animals are not more suitable than young ones. All animals are not equally susceptible, and while simple tarring may initiate true skin cancer in three or four months in a few mice out of a large number, in the majority six to nine months is necessary and in some animals (again few in number) no result may be obtained although tarring be continued for 18 months. It has been found that if tarring be discontinued after three to four months, the subsequent development of cancer takes place in much the same proportion of animals and after about the same lapse of time as in control series painted continuously. This latent period may be shortened if another form of injury—namely, scarification—be combined with tarring (Deelman). (Cf. the association of cancer of the tongue in man with rough tooth stumps, smoking, and syphilis).

Similar successful experiments have been carried out with unrefined paraffin oil and with arsenic in the form of arsenious acid. In all, the new growths arise at the site of application of the irritant. The origin of cancer at the site of local irritation thus receives final confirmation and the experiments demonstrate the importance of the chronicity and specific character of the irritants which are effective. Many attempts have been made to identify chemically the substance in tar which produces cancer, but beyond determining its presence in the fraction boiling at 300°—350° C. without success. It is unlikely that a single chemical constituent is responsible, and so far the only success with a pure substance has been that recorded above for arsenious acid.

An interesting variant in these experiments is the production of sarcoma in mice and rats by repeated subcutaneous inoculation of tar. This is of importance as showing that the refractoriness of rats to tar painting only holds for the covering epithelium and not for connective tissues which in the rat are much more frequently the site of new growths. Examples occur in the sarcomata due to animal parasites already mentioned.

Up to the present it has not been possible to induce carcinoma in animals which have already developed cancer either from application of tar or spontaneously. This seems to indicate that although cancer arises as a local process, systemic generalised changes accompany its development. The nature of these changes is quite obscure.

What are the Infective Sarcomata of Rous?

It is very remarkable that the infective sarcomata of the domestic fowl discovered by P. Rous, although providing the only positive examples of new growths transmissible without the intervention of intact cells, should have been so infrequently called on to support the arguments of those who favour the hypothesis of a microbic origin of malignant new growths.

These tumours, of which five or six strains are now in existence, all have the structure and biology of sarcomata although differing in histological details.

They all grow rapidly, infiltrate the muscles of the trunk and limbs and disseminate widely to the lungs and other internal organs. Glandular metastases are not a prominent feature of their progress. They can readily be transmitted to normal fowls by inoculation of tumour fragments under the skin, but with some of them, and notably the first strain isolated by Rous, only the original race of fowl (Plymouth Rock) was at first susceptible. It now grows nearly as well in several other races, especially in young birds. The distinguishing feature of these tumours is the fact that cell-free filtrates can also transmit the disease and the active principle withstands drying, the action of glycerine, and heating to 45° C. for half an hour. Each of these procedures destroys the vitality of all the transplantable tumours of the mouse and rat so far studied. The active agent behaves thus far like an ultramicroscopic virus, but it has not yet been possible to produce the disease with artificial cultures of it. The elucidation of the relation of this series of infective tumours to the other malignant new growths of birds and mammals depends on the solution of an extremely delicate problem—viz., Do the cells of these tumours when freed from the virus still behave as malignant new growths when introduced into the bodies of susceptible animals or do they behave as normal cells? If they behave as sarcomata then the virus has the property of inducing the change from normal to malignant cell with great rapidity and certainty. If they do not, then these tumours are in reality of the nature of granulomata, depending for their continued proliferation on the persistence and multiplication of the infecting organism.

BUCHAREST.

(From our own Correspondent.)

Effects of Facial Anomalies.

In addition to anomalies in different parts of the body which may exhibit a tendency to be far reaching in their effects, Dr. V. Molnár describes a class of case where a primary deep-seated anomaly of the face, and especially of the base of the skull, may lead to marked changes in the four extremities. He has had an opportunity of observing a series of such cases where the cranial anomalies were principally marked by early ossification and sclerosis of the base of the skull. The changes were usually seen in all four extremities, although they were most marked in the upper limbs. They may be manifested in three ways: (1) by the absence of a toe or finger, or as a general shortening of the limb; (2) by an increase in the number of fingers or toes, or a general increase in the size of the limb; (3) by a change which includes a partial excess and defect, such as an increase in the number of metatarsal bones, with amalgamation of either fingers or toes, and increase or decrease in the length of the extremities, as described by Prof. Babes. A remarkable fact about these phenomena is the symmetrical arrangement of the deformities as well as their resemblance to certain animal groups, the artiodactylates, and the perissodactylates. Dr. Molnar details a number of cases to illustrate his observations and believes that there is a region of the skull which stands in close relation to the development of the extremities. In other words, that a centre must be assumed to be in this region which determines the normal development of the extremities, and any change in shape or character of the former will result in an abnormal growth of the limbs. A further knowledge of this process may aid in clearing up some of the mysterious factors which underlie the differentiation of the various races and classes of animals.

Chronic Alcoholism in Roumanian Hospitals.

At a Roumanian Medical Congress held recently in Fimisoara, a report was read by Dr. Hatzuganu on the incidence of chronic alcoholism in several large hospitals of Roumania, with particular reference to Transylvania. During the past 15 years some 1950 cases of alcoholism were treated in the hospitals under his control, and of that number 60 per cent. were between 30 and 49 years of age. He made a careful study of 70 cases, and found that as a rule male alcoholics live longer than female. The autopsies frequently showed heart lesions in the form of brown atrophy and fatty degeneration. In the lungs œdema and congestion were most often seen. In the liver fatty degeneration was found in about 60 per cent. of the cases. Cirrhosis was frequent, though it is interesting that this condition has never been produced experimentally in animals. In no case was the liver normal. Chronic fibrosis was the commonest condition seen in the pancreas. The kidneys were never normal, chronic nephritis occurring in all but five patients, the parenchymatous variety being most frequent. In the stomach atrophic gastritis was found in many cases. The brain was almost always œdematous; acute and chronic meningitis occurred frequently, and atheromata of the cerebral vessels was not unusual. In his opinion the essential pathological processes caused by alcohol in the various organs of the body are hyperæmia, degenerations (particularly of the fatty kind), and connective tissue proliferation. The cases are often treated entirely for their nervous symptoms when the circulation needs treatment most. Symptoms vary markedly with idiosyncrasy and with the dilution of the alcohol used.

Skin Lesions caused by Mercury.

At a meeting of the Medical Society of Brasow, Dr. Saxlehner stated that he considered the most common mercurial eruption to be acne, such as occurs on the hairy part of the extremities in the form of nodular infiltrations of livid colour about a hair follicle. This condition, as well as various forms of transient dermatitis on the flexor surfaces of joints, is only induced by the external application of the drug. Eruptions after internal use may be of manifold character, varying from an erythema without desquamation or subjective symptoms to severe vesiculation and pustulation with involvement of nails, hair, and the mucous membranes, together with such severe constitutional disturbances that a general disease may be suspected. Thus measles, scarlet fever, erysipelas, hæmorrhagic purpura, multiform exudative erythema, and acute eczema may be simulated. The diazo-reaction may be positive.

The appearance of an eruption is independent of the combination of the drug employed and of the technique. There is nothing typical about form grouping and distribution of the lesions, but the peculiar violet colour, extensive desquamation, and the rapid disappearance after the drug is stopped are often typical. If the drug is introduced anew, the diagnosis can often be made by observing an exacerbation. In some cases mercury can be detected in the urine and the fæces. Idiosyncrasy plays an important rôle, but it is more an idiosyncrasy of organs than individuals, for in some the skin is readily affected, in others the internal organs, and in others again the nervous system. Patients who react readily by salivation and rise of temperature must be classed among the latter. Strangely enough, the organs in which mercury is usually deposited are not the same as those affected by idiosyncrasy. The same organ will generally continue to react even where the method of application is changed. In conclusion, a peculiar local reaction in syphilis is mentioned which may be of diagnostic value. Twelve or 24 hours after an injection of salicylate of mercury a macular or maculo-papular luetic eruption will spread or become confluent, and the colour will become more violet.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Exclusion of Foreign Practitioners.

LAST month the State Board of Medical Examiners of Texas decided to refuse to allow candidates to sit for examinations for the State licence to practise medicine until they had taken out their first papers for naturalisation. Twelve other States have already adopted similar regulations, many of them requiring full naturalisation and thus five years residence in America. The recent influx of foreign physicians into this country is raising the question of imposing similar restrictions in several other States.

Small-pox in Michigan.

During the first half of this year there have been 3999 cases of small-pox with 133 deaths in the State of Michigan. Of these totals the city of Detroit accounts for 1532 cases and no less than 106 deaths. The severity and virulence of the epidemic have been such in this city that even Christian Scientists have come to be vaccinated, and outside of the city it is estimated that a quarter of a million people were vaccinated in the last three weeks of June. There has been some overflow of contagion into Canada on the north and into Ohio to the south, but at the present time the epidemic would seem to be coming under control. It will have served to remind some of our antivaccinators that small-pox is not yet a matter of historical interest only, belonging, as they would have us believe, to a period when sewers were not invented.

The Ætiology of Scarlet Fever.

One of the most interesting papers presented at the recent meeting of the American Medical Association[1] was that of Drs. George F. and Gladys Henry Dick describing their research into the immunology and ætiology of scarlet fever. They recovered two culturally distinct strains of hæmolytic streptococci from the throats of scarlet fever patients and in one case from the infected finger of a nurse who had been attending a case of scarlet fever. One of these strains ferments mannite; the other does not. The Drs. Dick were able to produce experimental scarlet fever in human volunteers from both strains. They showed, however, that the power of agglutination of the immune sera was confined to homologous strains, thus refuting the contention of Tunnicliff and Dochez that the agglutination test may be used for the identification of scarlet fever streptococci. The toxin produced by these streptococci gives a typical reaction—malaise, nausea, vomiting, fever, and a scarlatinal rash appearing in susceptible persons a few hours after injection of the toxin and passing off in 48 hours. By commencing with minimal doses an immunity can be built up as shown by experiment on exposed individuals and by the skin test. The great difficulty in adopting this discovery to the requirements of preventive medicine at the present time is the absence of any method of standardising the toxin. In spite of this difficulty Dr. Abraham Zingher, of Schick test fame, has tested over 7000 school-children in New York for susceptibility to scarlet fever and found 8 per cent. positive and 60 per cent. pseudo-reactors. In a private co-educational school he found no less than 83 per cent. of the children to be susceptible. Dr. Zingher used a dilution of 1 in 1000 of crude toxin, but his figures must clearly be accepted with reserve until the toxin can be measured in some kind of minimal lethal dose.

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[1] THE LANCET, July 19th, 1924, p. 135.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 246.)

SECTION OF MEDICINE.

WEDNESDAY, JULY 23RD.

ON the first day of this section, Prof. A. J. HALL (Sheffield), the President, being in the chair, Dr. T. WARDROP GRIFFITH (Leeds) opened a discussion on

Cardiac Irregularities,

especially in relation to prognosis and treatment. He expressed his admiration for the work of the older observers who had long ago classified cardiac irregularities into those of time and force, and noted that the two were frequently combined. The irregularity produced by the missing of one beat in an otherwise regular series they termed an "intermission"; and they appreciated the fact that such an intermission might be due to a true intermission of cardiac action or to a weak beat not appearing at the wrist. He thought that in thus contrasting irregularity with intermission the older writers were expressing the difference between the arrhythmia that is now known as auricular fibrillation, and that dropping of the heart-beat which is usually the expression of an extrasystole. It was impossible to over-estimate the importance of the work of Sir James Mackenzie and Sir Thomas Lewis, whose experimental work and clinical observation had greatly raised the prestige of British scientific medicine.

Dr. Griffith classified cardiac irregularities into six main groups, according to their method of production: 1. Sinus arrhythmias. 2. From extrasystoles: (*a*) single, (*b*) double, (*c*) paroxysmal tachycardia. 3. From alternans. 4. A-V heart-block. 5. From sino-auricular block. 6. From fibrillation and flutter. Everybody was familiar with the very common form of irregularity associated with auricular fibrillation; it was present in over 50 per cent. of all patients admitted to hospital for cardiac failure. He traced the history of the growth of our knowledge of this subject from the original observation of James Mackenzie that complete arrhythmia was associated with that form of venous pulse which at that time he called "ventricular" down to Lewis's convincing electrocardiographic results. It was now known that the presence of a pulse which had no recognisable rhythm meant the presence of auricular fibrillation. In this condition hundreds of stimuli were showered by the auricle upon the auriculo-ventricular bridge; only a few of them, however, were able to cross the bridge, the ventricle responding, on "the all or nothing" theory, with the fullest efforts of which it was capable at the moment the stimulus was received. This resulted in contractions of varying force at irregular intervals. The development of auricular fibrillation was very variable, and it was certain that it was often of an abiding nature in cases where there was nothing to suggest the actual date of onset. The majority of patients soon complained of dyspnœa, with the usual symptoms of cardiac failure, but some were able to continue their ordinary life, and in them the condition was only detected when for some other reason a routine examination was made. It had been recognised for many years that the form of cardiac failure associated with a cardiac action devoid of rhythm called for the free use of digitalis; and it was now known that this beneficial action was due to the influence of digitalis in depressing the conductivity of the functional tissues which was especially developed in cases of auricular fibrillation. The number of stimuli reaching the ventricle was decreased; the ventricles, therefore, had a longer time in which to recover, and responded with stronger beats.

Opinions differed as to whether the action of digitalis was limited to this effect on the functional tissues or whether there was also some direct action on the muscle of the ventricle: as a result of clinical experience Dr. Griffith was himself strongly of the opinion that some such direct action must exist. The drug must be given in adequate doses; he gave 10 minims of the tincture every four hours or oftener; but he had had very little experience of the Eggleston method of massive doses. Complete heart-block might be produced without harm in some cases, but this result was not devoid of danger and should be avoided. If extrasystoles occurred as the heart-beat slowed it should be taken as a strong hint to stop the drug, but he did not go so far as Lewis and make it a universal rule to omit the digitalis in such conditions. Digitalis, however, did not cause the fibrillation to cease, and the pulse remained non-rhythmical; quinidine, on the other hand, did in some cases at least restore the normal rhythm, and the investigations made with this drug had further increased our understanding of this condition. Dr. Griffith confessed himself entirely convinced by Lewis's experimental proof of the theory of the "circus movement," according to which there was a continuous wave of contraction passing round a tract of auricular muscle, always with a short portion of responsive muscle between the advancing crest of the wave and its retiring tail. Quinidine had two actions: it lengthened the refractory period and also slowed conduction in the auricular musculature; and it was by a combination of these two actions that it abolished the circus movement and so restored the normal rhythm.

It remained to decide whether the restoration of normal rhythm was necessarily a desirable achievement. This depended on the answer to the questions: "What was the value of the restoration of the normal rhythm?" and "What were the dangers?" To restore normal rhythm would be to restore also the propelling power of the auricles and to equalise the amount of blood dealt with by the ventricles at each beat, both of them factors that must be desirable. The dangers could only be briefly noted, and amongst the most serious results that had been observed were nausea, vomiting, giddiness, palpitation, faintness, convulsions, syncope, respiratory difficulty, and other signs of heart failure; in some cases embolism had occurred. He would leave this matter to the meeting. It was well known that extrasystoles might arise in a number of different situations, the sino-auricular node, the auricular musculature, Tawara's node, the main bundle, and right or left ventricle. They could all be produced experimentally and detected by the electrocardiograph. It was reasonable to look upon extrasystoles as due to some irritable focus at their point of origin. In the case of the ventricles it frequently happened that an extrasystole fell after every normal systole, suggesting that the normal systole had supplied the stimulus for the discharge of the extrasystole that followed. Similarly, the first extrasystole might provide the stimulus for a second, and the second for a third; in this way the condition of paroxysmal tachycardia would soon be reached. It was of the utmost importance to recognise when a cardiac irregularity was due to extrasystoles, but occasionally it was impossible without instrumental methods. Irregularity from extrasystoles must be distinguished from sinus arrhythmia, flutter and fibrillation, and pulsus alternans. Prognosis would depend chiefly on the view taken of the conditions associated with the extrasystoles rather than on the actual irregularity. Pulsus alternans, in which every second beat was weak without the excuse of being premature, was an extremely grave sign, and when persistent provided strong evidence of myocardial degeneration.

Prof. **John Hay** (Liverpool) stated that prognosis and treatment both depended on the recognition of the type of irregularity present, and in his view there was nothing more important in the management of heart cases than the power to recognise the presence of auricular fibrillation. In fibrillation the normal rhythm was lost, the action of the ventricle was disorderly and chaotic, and the arrhythmia was aggravated by exercise. A rapid ventricular action was not an indispensable characteristic of fibrillation; even in the absence of treatment with digitalis it might be well within the normal limits. The common irregularities might be divided into two groups: (*a*) Sinus arrhythmia, the arrhythmia associated with respiration, and that due to premature beats. Other things being equal, the prognosis in this group was good. (*b*) Auricular fibrillation and the alternating pulse. With auricular fibrillation much distress, induced by the onset of fibrillation, a rapid ventricular rate, and a failure to respond to digitalis, were all of unfavourable import. The alternating pulse was admittedly an ominous sign, and he regarded the transitory alternation following an extrasystole much more seriously than did Dr. Wardrop Griffith. He had recently had the opportunity of pooling the results of several observers using quinidine; these were, briefly, that in 166 cases of fibrillation with valvular disease quinidine restored the normal rhythm for more than three months in 27·7 per cent. of cases. In cases of fibrillation without valvular disease the percentage of success was 40. Best results of all were obtained in Graves's disease, especially if the toxæmia was treated by partial thyroidectomy. The action of quinidine was also greatly increased if any septic focus was radically dealt with beforehand.

Dr. **W. J. Tyson** (Folkestone) recalled the position when the subject of prognosis in heart disease was discussed at the annual meeting in 1886, and explained the changes of views that had occurred since then. Although he did not use the polygraph and electrocardiograph he did not think that his patients had suffered thereby: but he freely admitted that by these means our knowledge of the classification and diagnosis of heart disease had been greatly advanced, although it was doubtful whether treatment had progressed to the same extent. In his view the greatest benefit conferred on patients by the work of Mackenzie and Lewis lay in the fact that it focused attention on the cardiac muscle rather than on the valvular disease. He deprecated the fashion of telling patients who suffered from no symptoms of heart disease that they were the victims of some cardiac irregularity.

Dr. **M. G. Foster** (Harrogate) said that the irregularities of youth and extrasystoles were not now viewed very seriously, but he was pessimistic over auricular fibrillation when the damage was already done at the onset of fibrillation, and he urged the need of further research to discover the cause of fibrillation.

Dr. **Halls Dally** (London) disagreed with the pessimistic view just expressed about auricular fibrillation; the more his experience increased the less gloomy became his view, and he knew of many patients who lived active and useful lives for many years. Digitalis was frequently given in dosage inadequate to secure a state of partial heart-block, or was not persisted with for sufficient periods. Quinidine achieved most success in chronic cases, and should be avoided in acute cases with rapid onset.

Dr. **G. J. Langley** (Manchester) considered that the most common cause of irregularity was produced by ventricular extrasystoles, which he divided into two groups, the commonest being physiological, associated with slow pulse-rate and removed by exercise; the second group was unaffected by exercise and indicated myocardial disease. He suggested that insufficient attention was paid to the inconvenience lengthy methods of treatment caused the patient, and advocated the massive dosage of digitalis as suggested by Eggleston, followed by quinidine for cases of auricular fibrillation.

Thursday, July 24th.

On the second day, Dr. **W. Langdon Brown**, Vice-President, being in the chair, a discussion on

Jaundice

was opened by Dr. **J. W. McNee** (London), who said that he desired to deal more particularly with the application of the new advances that had been made in the study of jaundice to medicine and surgery. As landmarks in the modern literature of icterus he chose first Wickham Legg's book published in 1880; next, the experimental work of William Hunter on the relation of the spleen to blood destruction, and of blood destruction to jaundice; and, lastly, Sir Humphry Rolleston's book published in 1912. The work which in recent years had had most influence in developing our knowledge of jaundice was then outlined, one of the most important developments being the work of Prof. Hijmans van den Bergh, who had discovered a method by which bilirubin could be detected and measured quantitatively in small amounts of albuminous fluids such as blood serum. Moreover, by this method it was possible to detect qualitative differences in the bilirubin present in the blood serum in different forms of jaundice. By means of this reaction a fundamental change in our conception of jaundice had been produced, and attention had been turned from the colour of the skin and mucous membranes to what was occurring in the blood.

The term "reticulo-endothelial system" was of recent origin, and had been applied by Aschoff to a system of endothelial cells scattered widely throughout the body, but having very specialised activities in certain situations. The cells which were of chief interest in the consideration of jaundice were the endothelial cells lining the sinuses of the spleen, and the endothelial cells of von Kupfer along the venous capillaries in the liver. The experimental production of icterus in birds by McNee seemed to show that in these animals the cells concerned in the breaking down of hæmoglobin and elaboration of bile pigment were the Kupfer cells of the liver and the reticulo-endothelial cells of the spleen, and not the polygonal cells of the liver. In birds the spleen was very poorly developed, and the Kupfer cells in the liver were very numerous; and if the liver was extirpated no real icterus followed. This work suggested a reconsideration of the whole problem, and the view that it was the reticulo-endothelial cells which were concerned in the production of icterus by hæmolysis was confirmed by Lepebne and others. Important experiments on dogs, in which only a "head and thorax" circulation remained, were carried out by Whipple and Hooper, and repeated by Rich, and McNee and Prusfk, but the results were somewhat contradictory, so that the experimental proof for a true hæmolytic icterus occurring apart from the liver could not yet be accepted as complete. The best evidence of a clinical nature was the appearance of bilirubin in hæmorrhagic effusions in the various body cavities, in which it seemed certain that the liver could take no part. It had, however, to be admitted that in such cases no general icterus ever occurred.

The view that jaundice might arise from disordered function of the glandular cells of the liver had been developed chiefly by the French school, and this explanation inferred that if bilirubin was elaborated by the reticulo-endothelial cells, the polygonal cells must be healthy in order to pass it on to the bile capillaries. On the view that it is the cells of the reticulo-endothelial system which elaborate bile pigment, and that the polygonal cells pass it on to the bile capillaries, a new theory of jaundice had been put forward; and to explain the two varieties of bilirubin, giving the "direct" and "indirect" van den Bergh reaction, it had been suggested that the bilirubin was modified in some way in passing through the glandular cells.

On this theory jaundice might be produced in four different ways: (1) When bile pigment was formed in the cells of the reticulo-endothelial system and passed on to the bile capillaries, but was then obstructed; this was the case in obstructive jaundice, and the van den Bergh test gave a prompt direct reaction. (2) Where the bile pigment was formed by the reticulo-endothelial system, but where it was not passed on to the bile capillaries owing to damage to the polygonal cells; the bilirubin then passed direct into the general circulation by the hepatic venous radicles. This occurred in toxic and infective hepatic jaundice, the van den Bergh test giving a biphasic reaction. (3) Where too much bilirubin was formed by the reticulo-endothelial system for the polygonal cells to deal with adequately and the excess naturally passed straight into the hepatic vein. Such was the condition in hæmolytic jaundice, and the van den Bergh test gave a delayed or negative reaction. (4) Where there was both damage to the polygonal cells and obstruction in the bile-ducts. Here some bilirubin would pass direct to the hepatic vein, some would be passed on to the obstructed bile capillaries and be there reabsorbed. This would produce a combined form of icterus with variable van den Bergh reactions, such as occurred in catarrhal jaundice. Dr. McNee then suggested that the most suitable classification of jaundice at present was one arrived at on these lines: (1) Obstructive hepatic jaundice; (2) toxic and infective hepatic jaundice; (3) hæmolytic jaundice.

The clinical use of the van den Bergh test enabled the progress of an attack of jaundice to be traced; it had shown that the colour of the skin was no guide to the amount of bilirubin in the blood; further, it had revealed the condition of "latent icterus," and many diseases, notably pernicious anæmia, which had not previously been considered in the light of their icteric nature, had been brought into the group of latent hæmolytic jaundice. It gave extremely useful information during treatment with salvarsan, and made it possible to distinguish between obstructive and hæmolytic jaundice.

Prof. HIJMANS VAN DEN BERGH (Utrecht) reminded the meeting that it was Dr. McNee who had first suggested the probability that it was the cells of the reticulo-endothelial system that elaborated bile pigment, and by so doing had turned our thoughts on the production of jaundice in a new direction. He knew of no clinical observations that would not agree with Dr. McNee's theory, and it agreed entirely with his own investigations. He agreed that it was impossible to prove the existence of a true hæmolytic jaundice experimentally, and so far as animal experiments went it must be remembered that animals differed greatly from one another and from man as regards liver function. In all experiments on dogs it should be kept in mind that their kidney threshold for bilirubin was extremely low. With regard to the formation of bilirubin in hæmorrhagic effusion, the diazo-reaction allowed the process to be studied quantitatively, and they had found that the bilirubin content of the effusion was incomparably higher than that of the blood. The doubt as to whether this pigment was truly identical with bilirubin had been completely dispelled by the work of H. Fischer. The explanation why these effusions were not accompanied by jaundice might well be that no absorption took place, or possibly it might be due to some obscure difference between the pigments with the direct and indirect reaction. With regard to the diazo-reaction, Prof. van den Bergh emphasised that he did not consider the quantitative method a very perfect one, but on the whole he thought that the original method gave more satisfactory results than any later modification. There were, however, occasions when he found some of the other methods helpful. Hæmatin, methæmoglobin, and bilirubin might all be found in the blood together, and in these cases some chemical test was essential. Care must also be taken to distinguish icterus from the yellow colour due to luteinæmia. Lutein, which was sometimes absorbed in quantity by people who eat freely of green vegetables and eggs, had nothing to do with bilirubin. After describing some of the conditions in which he had found the test of value, Prof. van den Bergh concluded by discussing briefly the two varieties of bilirubin. There certainly existed the two varieties, but the nature of the difference was unknown. It was true that one form was usually found in obstructive jaundice and the other in hæmolytic jaundice, but exceptions to this rule occurred which it was as yet impossible to explain.

Sir WILLIAM WILLCOX (London) said that there would be general agreement with Dr. McNee's classification of jaundice. It would be agreed by most people that a hæmolytic jaundice did occur, although it was relatively uncommon chemically; but the evidence for it from animal experiments was by no means convincing. He thought that by far the best evidence was to be found on the clinical side. Toxic and infective hepatic jaundice was, in his view, by far the most important type and the commonest. Jaundice of this type might be produced by poison, chemical, bacterial, or protozoal, or by auto-intoxication. The explanation of this type of jaundice was to be found in a consideration of the function of the liver which had been insufficiently recognised—the "toxiphylactic" function of the liver. The liver was the main protective organ of the body from poisons of all kinds, and in doing its duty in this direction was often irreparably damaged; the passage of bile into the bile capillaries was interfered with and jaundice resulted. The depth of jaundice was no measure either of the severity of the toxic action or of the degree of hepatic deficiency. Sir William Willcox drew attention to the variations that were found in the times that elapsed between the toxic action on the liver and the onset of jaundice. He stated that in catarrhal jaundice the lævulose test always gave evidence of impairment of hepatic function, and he was sure that the view of the French school was correct—viz., that catarrhal jaundice was a liver-cell degeneration set up by an intestinal bacterial infection.

Dr. LANGDON BROWN said that the old conception of hæmatogenous jaundice was returning in the new guise of hæmolytic jaundice. He thought the correctness of the French view of catarrhal jaundice had come out clearly, and he instanced cases of this disease in which the van den Bergh reaction was mainly indirect, while hepatic insufficiency was proved by the lævulose and lipase tests. Dr. McNee's work explained why splenic anæmia might arise from different diseases of the spleen, and it threw much light on latent jaundice.

Dr. PLATT brought forward some observations suggesting that in acholuric jaundice the red cells might actually develop an increased resistance to hæmolysis.

Mr. R. H. PARAMORE (Rugby) discussed the relationship of the blood flow through the hepatic capillaries with the rise of toxic jaundice, referring especially to the jaundice that is sometimes seen in the so-called toxæmias of pregnancy.

FRIDAY, JULY 25TH.

On the third day Prof. F. W. EURICH (Bradford), Vice-President, being in the chair, Dr. W. MCCONNEL WANKLYN opened a discussion on

Small-pox,

with especial reference to diagnosis. He dealt first of all with small-pox in its general bearing, and said that the essential thing in any such consideration was to surround oneself with the psychological atmosphere of small-pox, and he did not intend to delay in order to discuss the two main types of the disease and the clinical or pathological phenomena which distinguished them. Small-pox was not a beautiful scientific specimen to be cherished, it was a poisonous and devilish enemy to be put utterly to the sword. Small-pox had been protected, and was still being protected, in this country by misunderstanding and misrepresentation; it was one of the duties of the medical profession to tear down this cloak and expose the nakedness and foulness of the mischief behind it. Once small-pox was so displayed it would have short shrift.

Dr. Wanklyn then showed curves contrasting the percentage of London infant vaccinations with the percentage of freedom from small-pox in London. The striking feature of the curves was that whereas the percentage of infant vaccinations had fallen steadily since 1904 to less than 45 per cent. in 1921, yet the percentage of freedom from small-pox was higher than ever, and had been at a constantly high level for the past 20 years. This was not due to any diminution in the virulence of small-pox, or to any general decrease in its incidence. Small-pox in other parts of the world was still highly virulent, and competent observers estimated that there were at least one million cases of small-pox in the world every year. No explanation could be found in improved sanitation. He could state with authority and intimate knowledge that the one factor which had pulled small-pox down and which was now holding it down was the team-work of the profession and the voluntary civic spirit of its members. Small-pox abounded in the world at large, and it was as dangerous as ever to the people of these islands, whose decreasing use of vaccination had made them individually almost defenceless to small-pox, and had greatly increased the general risk. It had been countered only by the continued shepherding efforts of the medical officers and their colleagues, but for whose efforts small-pox would sweep again across these islands as calamitously as ever. The clearance of small-pox was a civic task that members of the medical profession must undertake in their capacity as citizens; they were not only citizens, but citizens with special knowledge whose duty it was to lead the way.

The one supreme weapon for holding small-pox was accurate diagnosis. Diagnosis might be said to be the discarding of the unimportant and concentration on the essential features of the case; and the first question on which hung all the rest was "Can this be small-pox?" To answer this question one should recall in methodical series the different varieties and stages of the disease. If small-pox cannot be eliminated by this process a more careful investigation of the lesions must be undertaken. For this a thoroughly good light and a view of as much of the skin as possible were desirable. Too much attention must not be paid to the old text-book signs—shottiness, umbilication, uniloculation, cropping, the rash being in different stages, or on the soles of the feet, spots on the palate. These were not sufficiently distinctive. The four master cards were: (1) prostration, (2) distribution, (3) localisation, (4) maturation, and of these distribution was the soundest of all; its key was that the rash of small-pox favours the irritated and shuns the unirritated surfaces. Prostration was not an absolute sign, but a copious rash preceded by complete absence of prostration was a strong argument against small-pox.

Dr. C. KILLICK MILLARD (Leicester), whose paper was read in his absence, said he thoroughly agreed with all the opener had said about the importance of accurate diagnosis, and he thought that no student should be allowed to qualify without giving specific evidence that he was at least able to suspect small-pox when he saw a case. He also agreed as to the unreliability of the old text-book signs. He divided the body into (*a*) trunk, (*b*) limbs, ignoring the head and neck. If after a careful count the lesions were more numerous on the limbs, the case was certainly one of small-pox; whereas if they were more numerous on the trunk it was almost certainly chicken-pox. There was no other single test of equal value to this distribution test. With Dr. Wanklyn's remarks on the general aspect of small-pox he was by no means in such complete agreement. He was unable to foretell what the future had in store for Leicester, but he had always said that whenever small-pox visited Leicester it demonstrated unmistakably the power of vaccination to protect the individual; but it also demonstrated that the orthodox view as to the great value of infant vaccination in protecting the community was greatly over-estimated. Although he agreed with Dr. Wanklyn's lucid description as applied to Asiatic small-pox, he thought it was unfair to apply it to the American form. Alastrim small-pox was not a deadly or disfiguring disease, although it was undoubtedly true small-pox. He disagreed with Dr. Wanklyn's estimate of the cost to the community of dealing with an outbreak of small-pox, but he associated himself heartily with the plea to develop team-work so as to sweep the disease out of the country.

Dr. R. P. **Garrow** gave an account of the epidemic of mild small-pox prevalent at Chesterfield. The disease as it existed in Chesterfield differed strikingly in many ways from typical virulent small-pox. It was milder, less infective, and was controlled by a less degree of vaccination. It was not characterised by scaring, the rash was small in size and unilocular, and evolution was more rapid. The crust formed was not the typical crust of small-pox, because the lesions did not go on to real pustulation; it appeared rather as an agglomeration of golden grains, as if due to the drying up of a clear serum. So far as the Chesterfield epidemic was concerned, no cases of virulent small-pox had occurred.

Dr. E. H. **Snell** (Coventry) thought that the main difficulty caused by the present epidemic of mild cases was the administrative use of controlling it. The man in practice was met by cases which showed only a few pimples so negligible that the patient said nothing about them. There was nothing about the cases in the ordinary way to arouse suspicion of small-pox, and so they went unrecognised and continued to spread the disease.

Dr. J. A. **Watt** described the epidemic at Derby, which was very similar to that at Chesterfield.

Dr. **Eurich** read a paper on the *Clinical Features of Anthrax*, illustrated by lantern slides. He described the clinical appearances of the pulmonary and intestinal forms of the disease. In these forms the disease was so rapidly fatal that there was no time to undertake any laboratory investigations that might possibly prove helpful in establishing the diagnosis. He emphasised the fact that in cutaneous anthrax the diagnosis was bacteriological, and that microscopical examination for the anthrax bacillus should be made by the practitioner himself without delay. As regards treatment, he did not excise the pustule except in special cases; the part was kept absolutely at rest and Sclavo's serum injected, 80 c.cm. being given for the initial dose; a second dose of 60 c.cm. followed 18 hours later, with more injections later if needed.

Dr. F. C. **Eve** (Hull) read a paper on the *Domestic Estimation of Urinary Sugar*, describing a method by means of which patients can themselves measure the daily excretion of sugar. Every night the patient passes urine into a clean thermos flask. The specific gravity of the urine is taken and a lump of yeast is added to the urine. The flask is corked with cotton-wool. After fermentation the specific gravity is again taken, and will be reduced to an extent proportional to the amount of sugar originally present. The resulting specific gravities are charted daily in two curves, the closer the two curves approximate the less the sugar excreted.

SECTION OF OPHTHALMOLOGY.

WEDNESDAY, JULY 23RD.

The President of this section, Mr. A. **Maitland Ramsay** (Glasgow) referred to the loss which the section had recently sustained through the death of one of their vice-presidents, Mr. G. H. Oliver (Bradford). As Prof. **Ignacio Barraquer** (Barcelona) had been prevented from attending the meeting to open the discussion, the Secretary (Dr. J. D. McCulloch) read Dr. Barraquer's paper on

The Intracapsular Method of Cataract Extraction.

Dr. Barraquer in his paper described the classical operation by cystotomy as extraordinarily imperfect from a surgical point of view. It involved (1) making pressure on the eyeball: (2) retention in the eye of the greater part of the capsule and some of the cortex of the lens; and (3) the entrance of unnecessary instruments into the eye. The many methods of intracapsular extraction, devised by Daviel and others from 1745 onwards, fell into two groups (1) by traction and (2) by pressure. The traction methods of Kalt and Knapp were those most frequently adopted in the former class, but had never become popular. The instruments employed usually tore the capsule, and the operation became an ordinary cystotomy with all its inconveniences, aggravated by the complications caused by severe traction on the zonule. Smith's brilliant successes had demonstrated the great advantages of intracapsular extraction, but in other hands his operation had not met with equal success. Dr. Barraquer said that in 1916 he arrived at the idea of a pneumatic forceps (cup) that would grasp the lens by its anterior face, and without breaking its capsule, by stretching, would detach it from its attachments and pull it out entirely. Experience showed the advantage of rupturing the fibres of the zonule close to the lens instead of at their ciliary attachment. This he secured by giving a vibratory movement in the vacuum. The large iridectomy, done in the earlier cases, proved to be unnecessary; the adoption of the Hess peripheral iridectomy and the previous suturing of the conjunctival flap improved the operation; the paralysis of the orbicularis by injection of novocaine by Van Lint-Millard's technique was also adopted. Among the indispensable conditions for successful performance of his operation were the use of a perfect erisiphaque, well regulated beforehand with reference to the physical conditions of the cataract on which the operation was to be done, the avoidance of all pressure on the eyeball, and the preservation of the sphincter of the iris. In his own clinic, failure to secure a black, central, round pupil with S/10 vision was exceptional. The advantages of his operation were specially noteworthy in diabetic and myopic cases. Vitreous ruptures and iritis occurred less frequently than with the old operation. He said that he had practised cataract extraction by capsulotomy for 16 years, and by phaco-eresis for eight years, and during the latter period the percentage of patients with normal visual acuity was more than double that in the former period; and the number of operative accidents and post-operative complications had diminished in the same way. The technique was not difficult, though completely different from that of other operations. Recent statistics published by Dr. Basterra (Madrid), Saint-Martin (Toulouse), Guiral (Habana), Green (San Francisco), and others showed the success of the operation in other hands.

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Mr. Sinclair then detailed his own operation, speaking from an experience of 52 cases. He hoped that further experience would lead to improvement both of instruments and technique. The usual precautions were taken before the operation. The condition of the lens was examined with the pupil dilated: (1) by focal illumination; (2) by the ophthalmoscope; and (3) by the corneal microscope, two or three days before the operation. The type of cataract and the stage of advance were carefully investigated, but at present there was not sufficient certainty in the interpretation of appearances. The forceps were

Sir **WILLIAM WILLCOX** (London) said that there would be general agreement with Dr. McNee's classification of jaundice. It would be agreed by most people that a hæmolytic jaundice did occur, although it was relatively uncommon chemically; but the evidence for it from animal experiments was by no means convincing. He thought that by far the best evidence was to be found on the clinical side. Toxic and infective hepatic jaundice was, in his view, by far the most important type and the commonest. Jaundice of this type might be produced by poison, chemical, bacterial, or protozoal, or by auto-intoxication. The explanation of this type of jaundice was to be found in a consideration of the function of the liver which had been insufficiently recognised—the "toxiphylactic" function of the liver. The liver was the main protective organ of the body from poisons of all kinds, and in doing its duty in this direction was often irreparably damaged; the passage of bile into the bile capillaries was interfered with and jaundice resulted. The depth of jaundice was no measure either of the severity of the toxic action or of the degree of hepatic deficiency. Sir William Willcox drew attention to the variations that were found in the times that elapsed between the toxic action on the liver and the onset of jaundice. He stated that in catarrhal jaundice the lævulose test always gave evidence of impairment of hepatic function, and he was sure that the view of the French school was correct—viz., that catarrhal jaundice was a liver-cell degeneration set up by an intestinal bacterial infection.

Dr. **LANGDON BROWN** said that the old conception of hæmatogenous jaundice was returning in the new guise of hæmolytic jaundice. He thought the correctness of the French view of catarrhal jaundice had come out clearly, and he instanced cases of this disease in which the van den Bergh reaction was mainly indirect, while hepatic insufficiency was proved by the lævulose and lipase tests. Dr. McNee's work explained why splenic anæmia might arise from different diseases of the spleen, and it threw much light on latent jaundice.

Dr. **PLATT** brought forward some observations suggesting that in acholuric jaundice the red cells might actually develop an increased resistance to hæmolysis.

Mr. **R. H. PARAMORE** (Rugby) discussed the relationship of the blood flow through the hepatic capillaries with the rise of toxic jaundice, referring especially to the jaundice that is sometimes seen in the so-called toxæmias of pregnancy.

FRIDAY, JULY 25TH.

On the third day Prof. **F. W. EURICH** (Bradford), Vice-President, being in the chair, Dr. **W. MCCONNEL WANKLYN** opened a discussion on

Small-pox,

with especial reference to diagnosis. He dealt first of all with small-pox in its general bearing, and said that the essential thing in any such consideration was to surround oneself with the psychological atmosphere of small-pox, and he did not intend to delay in order to discuss the two main types of the disease and the clinical or pathological phenomena which distinguished them. Small-pox was not a beautiful scientific specimen to be cherished, it was a poisonous and devilish enemy to be put utterly to the sword. Small-pox had been protected, and was still being protected, in this country by misunderstanding and misrepresentation; it was one of the duties of the medical profession to tear down this cloak and expose the nakedness and foulness of the mischief behind it. Once small-pox was so displayed it would have short shrift.

Dr. Wanklyn then showed curves contrasting the percentage of London infant vaccinations with the percentage of freedom from small-pox in London. The striking feature of the curves was that whereas the percentage of infant vaccinations had fallen steadily since 1904 to less than 45 per cent. in 1921, yet the percentage of freedom from small-pox was higher than ever, and had been at a constantly high level for the past 20 years. This was not due to any diminution in the virulence of small-pox, or to any general decrease in its incidence. Small-pox in other parts of the world was still highly virulent, and competent observers estimated that there were at least one million cases of small-pox in the world every year. No explanation could be found in improved sanitation. He could state with authority and intimate knowledge that the one factor which had pulled small-pox down and which was now holding it down was the team-work of the profession and the voluntary civic spirit of its members. Small-pox abounded in the world at large, and it was as dangerous as ever to the people of these islands, whose decreasing use of vaccination had made them individually almost defenceless to small-pox, and had greatly increased the general risk. It had been countered only by the continued shepherding efforts of the medical officers and their colleagues, but for whose efforts small-pox would sweep again across these islands as calamitously as ever. The clearance of small-pox was a civic task that members of the medical profession must undertake in their capacity as citizens; they were not only citizens, but citizens with special knowledge whose duty it was to lead the way.

The one supreme weapon for holding small-pox was accurate diagnosis. Diagnosis might be said to be the discarding of the unimportant and concentration on the essential features of the case; and the first question on which hung all the rest was "Can this be small-pox?" To answer this question one should recall in methodical series the different varieties and stages of the disease. If small-pox cannot be eliminated by this process a more careful investigation of the lesions must be undertaken. For this a thoroughly good light and a view of as much of the skin as possible were desirable. Too much attention must not be paid to the old text-book signs—shottiness, umbilication, uniloculation, cropping, the rash being in different stages, or on the soles of the feet, spots on the palate. These were not sufficiently distinctive. The four master cards were: (1) prostration, (2) distribution, (3) localisation, (4) maturation, and of these distribution was the soundest of all; its key was that the rash of small-pox favours the irritated and shuns the unirritated surfaces. Prostration was not an absolute sign, but a copious rash preceded by complete absence of prostration was a strong argument against small-pox.

Dr. **C. KILLICK MILLARD** (Leicester), whose paper was read in his absence, said he thoroughly agreed with all the opener had said about the importance of accurate diagnosis, and he thought that no student should be allowed to qualify without giving specific evidence that he was at least able to suspect small-pox when he saw a case. He also agreed as to the unreliability of the old text-book signs. He divided the body into (*a*) trunk, (*b*) limbs, ignoring the head and neck. If after a careful count the lesions were more numerous on the limbs, the case was certainly one of small-pox; whereas if they were more numerous on the trunk it was almost certainly chicken-pox. There was no other single test of equal value to this distribution test. With Dr. Wanklyn's remarks on the general aspect of small-pox he was by no means in such complete agreement. He was unable to foretell what the future had in store for Leicester, but he had always said that whenever small-pox visited Leicester it demonstrated unmistakably the power of vaccination to protect the individual; but it also demonstrated that the orthodox view as to the great value of infant vaccination in protecting the community was greatly over-estimated. Although he agreed with Dr. Wanklyn's lucid description as applied to Asiatic small-pox, he thought it was unfair to apply it to the American form. Alastrim small-pox was not a deadly or disfiguring disease, although it was undoubtedly true small-pox. He disagreed with Dr. Wanklyn's estimate of the cost to the community of dealing with an outbreak of small-pox, but he associated himself heartily with the plea to develop team-work so as to sweep the disease out of the country.

Dr. R. P. GARROW gave an account of the epidemic of mild small-pox prevalent at Chesterfield. The disease as it existed in Chesterfield differed strikingly in many ways from typical virulent small-pox. It was milder, less infective, and was controlled by a less degree of vaccination. It was not characterised by scaring, the rash was small in size and unilocular, and evolution was more rapid. The crust formed was not the typical crust of small-pox, because the lesions did not go on to real pustulation; it appeared rather as an agglomeration of golden grains, as if due to the drying up of a clear serum. So far as the Chesterfield epidemic was concerned, no cases of virulent small-pox had occurred.

Dr. E. H. SNELL (Coventry) thought that the main difficulty caused by the present epidemic of mild cases was the administrative use of controlling it. The man in practice was met by cases which showed only a few pimples so negligible that the patient said nothing about them. There was nothing about the cases in the ordinary way to arouse suspicion of small-pox, and so they went unrecognised and continued to spread the disease.

Dr. J. A. WATT described the epidemic at Derby, which was very similar to that at Chesterfield.

Dr. EURICH read a paper on the *Clinical Features of Anthrax*, illustrated by lantern slides. He described the clinical appearances of the pulmonary and intestinal forms of the disease. In these forms the disease was so rapidly fatal that there was no time to undertake any laboratory investigations that might possibly prove helpful in establishing the diagnosis. He emphasised the fact that in cutaneous anthrax the diagnosis was bacteriological, and that microscopical examination for the anthrax bacillus should be made by the practitioner himself without delay. As regards treatment, he did not excise the pustule except in special cases; the part was kept absolutely at rest and Sclavo's serum injected, 80 c.cm. being given for the initial dose; a second dose of 60 c.cm. followed 18 hours later, with more injections later if needed.

Dr. F. C. EVE (Hull) read a paper on the *Domestic Estimation of Urinary Sugar*, describing a method by means of which patients can themselves measure the daily excretion of sugar. Every night the patient passes urine into a clean thermos flask. The specific gravity of the urine is taken and a lump of yeast is added to the urine. The flask is corked with cotton-wool. After fermentation the specific gravity is again taken, and will be reduced to an extent proportional to the amount of sugar originally present. The resulting specific gravities are charted daily in two curves, the closer the two curves approximate the less the sugar excreted.

SECTION OF OPHTHALMOLOGY.

WEDNESDAY, JULY 23RD.

The President of this section, Mr. A. MAITLAND RAMSAY (Glasgow) referred to the loss which the section had recently sustained through the death of one of their vice-presidents, Mr. G. H. Oliver (Bradford). As Prof. IGNACIO BARRAQUER (Barcelona) had been prevented from attending the meeting to open the discussion, the Secretary (Dr. J. D. McCulloch) read Dr. Barraquer's paper on

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Mr. Sinclair then detailed his own operation, speaking from an experience of 52 cases. He hoped that further experience would lead to improvement both of instruments and technique. The usual precautions were taken before the operation. The condition of the lens was examined with the pupil dilated: (1) by focal illumination; (2) by the ophthalmoscope; and (3) by the corneal microscope, two or three days before the operation. The type of cataract and the stage of advance were carefully investigated, but at present there was not sufficient certainty in the interpretation of appearances. The forceps were blunt and toothless. The lower margins of the blades, which came into apposition when the instrument was closed, had a specially designed curve, were smooth, and met in a clamp-like manner. The shanks of the forceps did not meet, and all projecting parts were carefully rounded off so as to cause no injury to the cornea or iris. The correct apposition of the blade margins was insured by stops on the handles. Too great pressure was prevented by an adjustable nut on the lowest stop. The upper aspect of the closed blades formed a small spoon-shaped or boat-shaped cavity or cup. This was directed upwards when the instrument was in position, and could be clearly seen through the cornea. The lower aspect of the closed blades was convex and keel-like, and when the instrument was first placed in position rested lightly upon the central part of the anterior capsule of the lens. This forceps, which he had had in use in its present form for some time, was modified from a pair of Kalt's forceps purchased in New York in 1920. It had been modified in size, in shape, and in action. Recently he had found that the capsule of the lens seldom gave way where the forceps took hold, and he believed that this was in part due to the construction of the instrument.

Hitherto, Mr. Sinclair said, he had always performed iridectomy, and immediately after iridectomy the forceps were used. The blades were introduced closed through the central part of the incision with the point tilted downwards, so as to raise the edge of the corneal flap. As soon as the closed blades reached a position at, or a little beyond, the centre of the lens, they were placed, still closed, lightly on the lens capsule, and opened widely to 4 or 5 mm. During the opening movement the blades were held in light contact with the surface of the lens. The pupil margins, which he had often seen in contact with the outer aspect of the blades, were gently pressed asunder, and he had never seen the iris injured in any way or caught by the forceps. When the opening movement of the blades ceased, the closing movement should begin without any delay, and, as this closing movement began, the blades were gently pressed against the lens capsule. This gentle pressure was increased as the closure proceeded, so that the convex edges of the clamping margins of the blades dimpled or indented the capsule into the soft subcapsular cortex of the lens. As the closing blades approximated the pressure on the lens was progressively increased, and at this stage it could be clearly seen through the cornea that a relatively large mound of capsule-covered cortex was forming between the blades. When the closure was complete the cup of the forceps contained quite a considerable mass of capsule-covered cortex. This contained cortex distended the portion of capsule within the cup, and, during the traction which followed, prevented it slipping from between the lower margins of the blades, and thus too great pinching pressure upon the capsule was unnecessary. The construction and large size of the blades also helped to spread or distribute the strain upon the capsule. The degree of approximation or pressure of the blade margins was arranged prior to the operation by the setting of the adjustable nut on the lowest stop between the handles. Immediately the forceps had been completely closed, a gentle forward movement towards the centre of the cornea was made, and the forceps held forward in this position for an appreciable period, say for five seconds or more. This first movement forward put the lens capsule on the stretch all round and began the moulding of the lens. When this forward movement was considered sufficient, the direction of traction was altered so as to bring the greatest degree of tension to bear upon one part of the suspensory ligament at a time. "If we suppose the cornea to be marked like a clock face as viewed from the front," he said, "I should begin the lateral traction forwards and to the side, towards 2 o'clock, and afterwards towards 10 o'clock, and then towards 12 o'clock, always maintaining a partially forward movement." The suspensory ligament appeared to give way at one place at a time, and always below the horizontal meridian. Once the rupture of the ligament had begun the subsequent separation was much easier, and the ligament seemed to strip off from the lens margin. In cases where the zonule gave way easily the above stages of the procedure might not be noticeable. At this stage, which lasted often about half a minute, but had varied from 10 to 15 seconds in one case to 60 to 70 seconds in another, the lens began to yield and to come forward at the lower part. The forceps traction was constantly maintained but with a little less strength so as to bring the lens forward and towards the wound very slowly. This slow, gentle but continuous traction, which Mr. Sinclair had found to be the best, gave time for the separation of the remaining suspensory ligament attachments, and also for the slow separation of the lens from its bed upon the anterior surface of the vitreous humour. The lens underwent considerable alteration of shape from traction, &c. Care must be taken to prevent sudden exit of the lens when its largest diameter was emerging. Stroking of the cornea usually sufficed for reposition of the iris. Atropine was used either before operation or immediately after.' There had been loss of vitreous in seven cases, of which four were slight. Only in three cases had the effect on vision been serious. Thirty-two cases obtained vision of six-ninths or more.

Mr. Sinclair desired to express his indebtedness to Dr. Charles W. Graham, senior clinical tutor in the ophthalmic department at Edinburgh, for his very able and skilful assistance in this series of cases. A cinematograph film of the operation added to the interest of the paper.

Discussion.

Lieut.-Colonel Henry Smith, I.M.S., said a liberal incision was a sine qua non. For a Morgagnian cataract, expression was the only method. Complicated mechanism of Barraquer's instrument was a serious objection. Green (San Francisco) combined external pressure with the use of Barraquer's instrument. Minute investigation of the physical condition of the lens was not of great practical import. A swollen lens implied a fragile capsule. Intracapsular extraction had great advantages in cases with adhesions of the iris. He agreed that a large escape of vitreous was as fatal a disaster as a choroidal hæmorrhage. A small escape of vitreous was not serious, for it did not prevent retention of perfect vision for 20 years or more after the operation. He advocated controlling the upper lid during operation by an adjustable form of retractor affixed to a metal headband.

Mr. M. L. Hepburn (London) criticised Barraquer's method; its advantage did not counterbalance its dangers. He and his colleagues at the Moorfields Hospital had abandoned the operation, as their experience of it was unfavourable. In his opinion it was not to be recommended as the operation of the future.

Mr. J. Gray Clegg (Manchester) was not in favour of Barraquer's operation. The mechanism of his apparatus was too complex. Inquiries he had made as to the results obtained had led him to form an unfavourable opinion.

Mr. N. Bishop Harman (London) endorsed this view. He wanted more simplicity in operations. Colonel Smith's instrument for controlling the upper lid appeared likely to alarm the patient needlessly. Mr. Sinclair's method of operating looked simple and worthy of a trial.

Mr. Harrison Butler (Leamington) urged that the old operation yielded such good results that a rival operation must have strong claims to superiority to justify its adoption. He endorsed what other speakers had said of the great value of producing paralysis of the orbicularis by injection of novocaine.

Mr. R. J. Coulter (Newport) thought Colonel Smith's lid retractor unsuitable.

Mr. A. L. Whitehead (Leeds) referred to the need for simplicity in the apparatus employed in operating.

Smith's operation was not the operation of choice, as the average operator could hardly acquire the dexterity which had made it so successful in the hands of its originator. The operation which will produce the best results in the hands of the average operator, he said, was the one at which we should aim. During 25 years he had given systematic trial to various operations, and had finally come back to the old classical one. He very rarely had occasion to use novocaine to control the patients' lids.

Mr. E. E. MADDOX (Bournemouth) said he had done about 40 to 50 intracapsular operations, about half of these by Smith's method, and the others by the aid of a special form of vectis. In some cases Smith's operation was far superior to the ordinary one. He thought the operation of the future would be by the combined method, some pressure from the outside combined with sensible suction.

Mr. A. LITTLE (Bradford) gave a warning against discarding a very safe operation for one attended by considerable risks.

Mr. GORDON SPENCER (Mesopotamia) said we must have a simple operation. What he had seen of Smith's operation in other hands did not justify its general adoption. Barraquer's complicated apparatus was hardly suitable for conditions in Mesopotamia.

Mr. O. G. MORGAN (London) mentioned that in the Moorfields cases striate keratitis of some duration had followed Barraquer's operation. A little vitreous in the wound was as dangerous as a little capsule or iris. The classical operation was neither difficult nor dangerous.

In replying on the discussion,

Colonel SMITH said that experience in India would be the deciding factor in this controversy. His first pupil was now doing as many as 8000 cataracts a year in the Punjab. Mr. SINCLAIR said that he quite agreed with the plea for simplicity; that was one reason for the adoption of his present instrument instead of Barraquer's. Remains of cortex sometimes spoiled the results of the old operation.

Mr. A. L. WHITEHEAD then read a short paper on cases of paresis of accommodation occurring as a late symptom in encephalitis lethargica. These cases had most of them been diagnosed as influenza. The paresis had come on late in cases of slight severity. There had been slow and progressive improvement. His purpose in calling attention to these cases of partial cycloplegia was to emphasise its significance as a diagnostic sign.

THURSDAY, JULY 24TH.

Microscopy of the Living Eye.

At the second meeting of this section the chair was taken by Mr. R. J. COULTER (Newport), one of the vice-presidents, and the morning was devoted chiefly to the consideration of points arising in connexion with the use of the slit-lamp in investigating the anatomy and pathology of the living eye.

Mr. BASIL GRAVES, curator at Westminster Ophthalmic Hospital, and British Medical Association Science Research Scholar, read the first of the opening papers. His contribution, dealing with the normal eye, was restricted to presenting two features—one relating to the optical section of the aqueous fluid, the other to the optical section of the normal lens. It was customary, he said, to refer to the normal aqueous fluid as optically empty; he had been able to demonstrate that this was not the case. "The normal aqueous fluid, though admittedly only slightly so, is relucent." To demonstrate this relucency, a round beam of very small diameter should be used. With the ordinary Zeiss nitra slit-lamp the 1 mm. diameter dot diaphragm should be used; when using the arc slit-lamp the 0·5 mm. dot aperture is preferable. The beam should be directed at a suitable angle so as to avoid the corneal epithelium; it should be focused carefully midway between the cornea and lens; the beam should not strike the iris, for which reason it was an advantage to have the pupil dilated. The slit-lamp arm should be made to oscillate slowly up and down, so as to give movement to this faint beam, which will thereby be seen the more easily, and if a beginner, the gaze should be directed a little above or below the level at which he seeks to see the beam, so that its image may fall on the peri-macular retina. Mr. Graves held that this question of relucency of the aqueous was no mere scientific curiosity, but of practical importance in detecting the incipient stages of certain diseases. It was therefore advisable for the observer to have trained himself so as to appreciate the normal range of relucency of the aqueous fluid.

The second point to which he wished to call attention was the observation in the optical section of the lens of a restricted portion, differing from the rest of the lens section in having an almost metallic lustre. This was best seen often in a normal senile cortex, but was also met with, if carefully looked for, in younger lenses. The explanation of this phenomenon he believed to be that it was caused by a summation of successive multiple specular reflections from the laminated elements of the cortex. Further observations were necessary to elucidate the significance of this feature; possibly it might have some bearing on the prognosis of senile cataract. In concluding, Mr. Graves expressed his indebtedness for the facilities afforded him in his work on this subject at the Royal London Ophthalmic Hospital and at the Royal Westminster Ophthalmic Hospital.

The second opening paper was given by Mr. HARRISON BUTLER, who dealt with the pathological aspect. His paper was illustrated by a very fine series of lantern slides. Time prevented dealing with more than the fringe of so vast a subject. By the aid of the slit-lamp it was possible in ulcers stained with fluorescein to see how the green coloration passed along the lymph spaces, and penetrated deeply into the substance of the cornea. The slit-lamp, with its accurate localisation, enabled us to decide whether an abnormal condition observed was in the epithelial surface of the cornea or in the anterior, middle, or posterior lamellæ of its stroma. In herpes ophthalmicus a characteristic lesion was met with just inside Bowman's membrane. Folding of Descemet's membrane was seen with the slit-lamp in most inflammatory states of the anterior segment of the eye, and also constantly after operations upon the cornea. Such folds are invariably present in interstitial keratitis. In the late phases of an interstitial keratitis, when it appeared by other cruder methods of observation that the corneal vessels were functionless and atrophied, the slit-lamp would show that these fine vessels still permitted active flow of blood. The examination of the anterior chamber with the slit-lamp is, he said, of the very highest importance with reference to inflammatory states of the anterior segment of the eye. Keratitic precipitates (K.P.) can be detected when so small that they are apt to be overlooked by the older methods, and under high magnification much can be learned of their nature and significance. We are liable to regard flakes of absorbing cortex on the surface of the cornea as "mutton fat K.P." and to become unduly alarmed. "Black K.P. is very common after operation involving the iris, and I regard it as perfectly harmless." The detection of cellular elements in the aqueous may be the first sign of sympathising ophthalmitis and can give us timely warning of this formidable condition. The great advantage of the slit-lamp in the examination of the iris is that in addition to giving us a highly magnified stereoscopic picture of the superficial area, it enables us to illuminate from behind and see the iris in lens light. If there is any atrophy of the retinal pigmentary layer, or holes in this tissue, the light shines through and the condition is made evident. The various forms of cataract can be localised and minutely examined with the slit-lamp and the Czapski microscope. It is often possible as the result of this localisation to decide at what period of life an opacity developed. The slit-lamp has furnished so much information regarding the anatomy and pathology of the lens that all text-books are obsolete in this connexion. From the operative standpoint the slit-lamp is indispensable, for it gives an accurate knowledge of the nature of the cataract that we propose to extract or needle, and allows us to detect the earliest signs of inflammation both before and after operation. "I have already refused," he said, "to extract a lens that I should have operated on had the slit-lamp not forewarned me of chronic cyclitis." The appearances of the vitreous are varied and often very beautiful. It is hard to realise that a normal perfectly transparent vitreous is actually full of massive fibrils, of membranous films, and punctate opacities. It is hard to separate the physiological from the pathological. Considerable experience is requisite. At present examination of the retina by this method hardly comes within the scope of ordinary clinical work.

In conclusion, Mr. Butler said he had no doubt of the value of the slit-lamp. The ophthalmologist who had mastered its technique and had given enough time to the subject had raised himself to a higher plane of craftsmanship than before.

Mr. C. B. **GOULDEN** (London) followed with a short paper dealing with the reflections from the various surfaces of the eye. The surfaces of the cornea and lens acted as mirrors, each showing three methods of reflection: (1) By forming a real or virtual image; (2) by reflecting light diffusely, as every object which we see does; (3) by specular reflection. The best example of this in ordinary life is the peculiar reflection from the surface of a blackboard, with which most of us were familiar as schoolboys, which prevented us reading what was written on it. Another instance was the "specular reflection" from the painted surface of a door, in which one could see fine marks of the painter's brush, which could not be seen ordinarily. Similarly, in examining the eye certain irregularities in the reflecting surfaces could be made out by means of the specular reflection which could not be seen by any other means.

Mr. O. G. **MORGAN** (London) read a paper embodying observations made with the slit-lamp in a series of cases of cyclitis. In several of the cases definite iridescence of the posterior capsule of the lens was observed, in only one of which could any definite opacity be made out in it.

Mr. **HUMPHREY NEAME** (London) read notes of a case of posterior stellate cataract following trauma, in which the opacity disappeared completely in the course of a few weeks. The opacity showed the typical feather-shaped stellate appearance. Seventy-one days later no trace whatever of any lens opacity was found.

Mr. **GRAVES**, in replying, said that at present he did not feel that the slit-lamp was of real clinical value in the investigation of the vitreous. Vitreous dust could be seen as clearly with the electric ophthalmoscope, using a plane mirror and a high plus lens.

Mr. **BUTLER**, in replying, said that we knew so little about the vitreous at present that examination of it with the slit-lamp was more likely to lead us astray than otherwise.

At the Royal Eye and Ear Hospital, Bradford, in the afternoon of the same day, an interesting demonstration was given of the use of the slit-lamp. Various cases were shown. Mr. A. H. H. **SINCLAIR** and Lieut.-Colonel H. **SMITH** also demonstrated their methods of intracapsular extraction of cataract in the operating theatre.

Mr. J. A. **WILSON** (Glasgow) read a short paper on Sympathetic Ophthalmitis and Allied Conditions. Starting with the question, "How is disease of a particular type transferred from one eye to the other?" he discussed possible analogies with herpes and other diseases, and the question of transference of infective material by means of the perineural lymph spaces.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal statistics for 1923 of four cities and a county borough, the health reports of which are commented on below. The contrast between the mortality from respiratory diseases in the group and that in the group of "mill-towns" tabulated in our issue of August 2nd is marked.

Name of town.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Edinburgh ..	425,298	20·4	13·8	1·3	1·5	2·1	33	82	5·9
Brighton ..	135,802	16·0	12·4	0·9	1·8	2·1	27	60	0·8
Norwich	123,600	19·4	10·9	1·2	1·3	1·8	40	65	2·5
Carlisle	54,010	21·8	13·5	1·0	1·4	1·8	40	83	7·6
Worcester ..	49,860	18·5	10·9	1·1	1·1	1·7	30	57	2·1

Edinburgh.

Dr. William Robertson emphasises the fact that two accurate pointers to faulty environment are to be found in the tuberculosis and infantile mortalities. Thus St. Giles's Ward had a tuberculosis death-rate of 1·8, an infantile mortality figure of 109, and the central ward of Leith had an infantile mortality-rate of 111. "Too much must not be expected from the mere provision of houses fitted with modern conveniences. The cry of houses for the people is just, but it must not be uttered parrot fashion. Good housing must be accompanied by better behaviour, cleaner habits, and improved ideas of good citizenship." In the case of 852 overcrowded houses it was only possible to abate the overcrowding in 91 cases by means of removal or other arrangements. Dr. Robertson hopes the housing committee will ever keep in the forefront of its policy the liberal provision of recreation facilities for the children. An analysis of the working-class population shows that there are three classes. First, those who will gladly pay economic rent for modern houses; secondly, those who say they cannot afford to pay such rents; and thirdly, those who are undoubtedly poor. Among the latter classes are the people paying rents of 9s. and 11s. per week for one- and two-roomed farmed-out houses. A report has been made to the health committee on the question of providing a hostel for men and a hostel for women, and Dr. Robertson thinks there need be no hesitation in proceeding with these revenue-producing schemes. The Scottish Board of Health have approved the scheme for the clearance of the blackest spots of the Cowgate and Grassmarket. It is hoped that progress will be made when houses are ready for the occupation of the displaced tenants.

Towards the latter end of March the Broughton district suffered from an outbreak of milk-borne scarlet fever. The milk-supply came from the county of Linlithgow. The supply of this milk to Edinburgh was stopped, but the diversion of the infected milk to another consuming district led to a violent explosion of scarlet fever in that locality. The cow population in the city is 4281, and amongst these 24 cases of tuberculosis of the udder and three of advanced tuberculosis were found during the year. The four grades of milk recognised by the Scottish Board of Health are being used and the prices charged for milk from tuberculin-tested cows do not stand in the way. In the case of the first three grades producers are required to supply milk with a butter-fat content of 3·5 per cent. About 25 per cent. of the milk sold in the city is now supplied in bottles. The fourth grade of milk—namely, pasteurised milk—will soon be turned out in very large quantities and is welcomed by Dr. Robertson in view of the widespread milk-borne epidemics of scarlet fever which attacked the city in 1913, 1915, 1919, and 1921. The ordinary period for retention of scarlet fever patients in hospitals has been reduced from six or seven weeks to four weeks, in view of the want of evidence as to the infectivity of desquamating cases. More accommodation is thus set free for measles and whooping-cough. A disconcerting experience has been the appearance of a more virulent type of scarlet fever during the autumn. Thus the case-fatality of scarlet fever was 5·2 per cent. as compared with 1·9 per cent. in 1922. The Schick test for diphtheria is being utilised. The whole of the staff at the hospital have been immunised.

Dr. David Lees, the V.D. clinical medical officer, reports that the total number of patients who discontinued attendance before they were considered free from diseases amounted to 15·6 per cent., as compared with 18·5 during 1922. Although this is comparatively a satisfactory figure, Dr. Lees strongly favours some system of notification. At the beginning of the year 24 beds were allocated for the treatment of women and children at the Royal Infirmary and Royal Maternity Hospitals, and these beds have been fully occupied and of great assistance in treating innocent patients without any stigma being attached to them.

Dr. Robertson points out that the cost of dealing with tuberculosis during the past year was £35,160, whereas the cost of treating all other infectious diseases was £41,578, and he thinks this figure should prove an incentive for aiming at improved sanitary environment. The treatment of surgical tuberculosis by artificial sunlight is to be given a trial.

Brighton.

Dr. Duncan Forbes says Brighton's chief difficulty is inability to build large numbers of houses which can be let at economic rents, so as to overtake the present shortage and allow the slums to be swept away. He points out that the census figures show a large decrease in the number of men employed in the building trades and that the position is not hopeful unless there is dilution of labour or increased output by the individual workers. A table is given showing that the net expenditure of the Health Committee, exclusive of housing, is just under a 6*d.* rate and that for the school medical service just over ½*d.* rate. The club-room provided for male consumptives continues to fulfil its purpose of providing a place of interest and enjoyment under open-air conditions and simultaneously a certain measure of segregation. Members of the club attended 3553 times on the 311 days the club was open. It is now a condition that patients who book for the Sussex Maternity and Women's Hospital should attend the antenatal clinic. A dental clinic is now available for nursing and expectant mothers and children under 5 years of age, but only 57 per cent. of these patients kept the appointments made for them. Nearly all the midwives in Brighton now adopt the routine practice of treating the infant's eyes at birth with a 10 per cent. solution of argyrol. Seventeen cases of ophthalmia neonatorum were notified, 12 being very mild. No case of puerperal fever was notified during 1923.

The Milk and Dairies (Amendment) Act, 1922, is being operated. Early in the year 61 shops where milk was on sale were dealt with. In 20 the sale of milk was discontinued; in 27 the sale was only allowed in bottles; in 10 cases special compartments or rooms were set aside for the sale of milk; in one case the sale of greengrocery was given up, and in three cases no structural alteration was found necessary.

Regulations have now been made by the council for the prevention of eye-strain in cinema theatres as follows: (1) In the case of new or reconstructed theatres no seat shall be nearer to the picture-screen than 20 feet, and every seat must be so placed that the angle made by a line drawn from the top of the screen to the eye of the spectator shall make with the horizontal an angle of 35° or less; (2) in the case of existing theatres the minimum distance is 15 feet and the angle must not exceed 45°.

In his school report Dr. Forbes gives an interesting résumé of the improved present conditions of children who have recently undergone operations for tonsils and adenoids. He also reports that the zinc ionisation treatment of discharging ears has given very satisfactory results. Out of 104 cases of chronic otorrhœa 78 have been cured. In other cases deemed unsuitable for the treatment improvement has nevertheless resulted either by the lessening of the offensive odour or the reduction in quantity of the discharge. Nutrition tables for school-children of all ages have been drawn up as the result of much hard work by Dr. O. J. W. Adamson. These tables will be used in order to decide if the provision of meals, cod-liver oil, &c., is necessary.

Norwich.

Dr. H. Cooper Pattin reports that the natural increase in population continues to outstrip the supply of new dwellings. The increasing scarcity of houses compels toleration of undesirable habitations, prevents their closure, and intensifies overcrowding. A feature of much house property in the city is its worn-out condition, which makes reparation hopelessly unprofitable. Dr. Pattin hopes ultimately to see "all types of tuberculosis, pulmonary and non-pulmonary, hospital, sanatorium, colony, at all ages and in both sexes treated at Stanning Hall, where there is ample space and where also the aggregation of these folk should lead to considerable economy in administration expenses." He does not, however, think the special provision of institutional treatment for cases past recovery will serve any useful purpose until statutory power of compulsory segregation is conferred. The school dental officer finds defects in 68·2 per cent. of those whom he inspects.

Carlisle.

Dr. Joseph Beard comments at length on the failure of the system of notification of tuberculosis. Only 55·5 per cent. of the fatal cases lived more than three months after notification. It is found at the dispensary that 82 per cent. of the insured persons notified are in the late or advanced stage of the disease. Of 54 deaths which occurred within six months of notification 24 were insured persons. On the other hand, of the school-children referred to the tuberculosis dispensary, 82 per cent. come under observation at an early and hopeful stage of the infection.

Worcester.

Dr. Mabyn Read reports that the building of new houses does not keep pace with the growth of the population and that the shortage is getting worse year by year. Under present conditions closing orders cannot be made and the law cannot be put into operation with regard to gross overcrowding. Two small unhealthy areas have been "represented," occupied by 128 and 244 persons respectively, but no action can be taken until 80 houses "suitable for occupation by the poorest paid section of our population" have been erected. In October the female block of H.M. Prison was taken over by the council for housing purposes. In answer to an advertisement 170 applications were received and 18 families, comprising 54 adults and 56 children, are now housed in the "Castle." The rents payable by these tenants vary from 4*s.* 6*d.* to 7*s.* 6*d.* per week, which includes rates, gas for lighting and heating of corridors and cells. The accommodation provided for each tenant consists of one good living-room and a sufficient number of cells to give bedrooms for

the families concerned. Water-supplies and sinks are convenient and a large laundry provides ample facilities for washing purposes. Gas-stoves on the slot principle have been provided for cooking purposes.

Dr. Marion B. Andrews, the maternity and child welfare medical officer, reports a growth in the utilisation of home-helps, in the provision of dinners, and in the dental work. Where possible the provision of dinners for pregnant and nursing women is preferred, as being less likely to be diverted from its destined end than the issue of milk. The dinners are organised by the Infant Health Society, which, as Dr. Andrews tells us, is responsible for a great deal of valuable work. The rule is made that mothers pay £3 towards the cost of dentures, and it is pointed out that this charge is a serious obstacle for the mothers of families who are on the 'free-scale' in other respects. The limit of the 'free-scale' is a family income of 6s. per head, and, as Dr. Andrews puts it, the prospect of saving 60s. in a reasonable time on such an income is extremely remote. Nearly half the infant deaths were attributed to prematurity, and took place during the first fortnight of life. Dr. Andrews thinks these babies are usually washed and fed as normal children and some endeavours are now being made to meet their peculiar needs by stocking supplies of cotton-wool and olive oil for the use of the midwives. Classes for mothers have made progress, and the experiments of setting simple examination on mothercraft subjects has proved a success.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 26TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 52; scarlet fever, 1459; diphtheria, 670; enteric fever, 102; pneumonia, 457 (as against 570 of the previous week); puerperal fever, 38; cerebro-spinal fever, 9; acute polio-myelitis, 17; acute polio-encephalitis, 4; encephalitis lethargica, 69 (as against 81 of the previous week); dysentery, 4; ophthalmia neonatorum, 110. There were no cases of cholera, plague, or typhus notified during the week. Of the 52 cases of small-pox, 13 were notified from the county of Derby (Derby 2, Chesterfield 9, Chesterfield R.D. 1), 19 from the county of Northumberland (Ashington 18), 6 from the county of Nottingham (Hucknall 3, Mansfield 3), 2 from the county of Warwick (Coventry), 3 from Yorks, North Riding (Middlesbrough), and 9 from Yorks, West Riding (Rotherham C.B. 1, Rotherham R.D. 7). Of the cases of encephalitis lethargica, 8 were notified from the County of London (Bethnal Green 1, Deptford 1, Islington 1, Lambeth 1, Shoreditch 2, Stoke Newington 1, Woolwich 1), 5 from the county of Chester (Stockport 2), 2 from the county of Derby (Derby), 5 from the county of Durham, 3 from Essex (West Ham 2), 10 from the county of Lancaster (Manchester 4), 5 from the county of Stafford, 6 from the county of Warwick (Birmingham 3), and 5 from Yorks, West Riding (Sheffield).

Deaths.—In the aggregate of the great towns there was an increase of 12 in the total deaths. In London the number of deaths from all causes decreased from 750 to 729.

Royal East Sussex Hospital.—The year just ended in connexion with this institution at Hastings has been an anxious one. It has been marked by the removal from the old home to the present new institution, which was opened in November. A curtailment of its activities was necessitated for a time, during which there was a considerable falling off in the receipts from patients, and with a larger institution the larger had been the expenses without any increase in the income. The year was not a normal one, and the balance-sheet, which showed an excess of expenditure over income of £3524, cannot be accepted as a basis for the future. At the annual meeting on July 28th the governors, however, took a very wise step in adopting a suggestion which came from the mayor (Councillor Arthur Blackman) and appointed a committee to investigate the financial position. The findings of the committee will be watched with much interest by everyone interested in the administration of hospitals. It may be hoped that the committee will thoroughly thrash out the reason why the number of subscribers residing in Hastings and St. Leonards is out of all proportion to the size of the town.

Obituary.

THOMAS DAVID LISTER, C.B.E., M.D., B.S., M.R.C.P. LOND., F.R.C.S. ENG.,

CONSULTING PHYSICIAN, PRINCE OF WALES'S HOSPITAL FOR CONVALESCENT OFFICERS, MARYLEBONE, AND TO THE ASSOCIATION OF LOCAL GOVERNMENT OFFICERS.

We regret to announce the death on July 30th of Dr. T. D. Lister, whose work in connexion with tuberculosis and with life assurance problems was of high value. Born in London on Jan. 30th, 1869, the son of Francis Wilson Lister and Elizabeth Wishart, only daughter of David Roy, of Glasgow, he received his early education at the Haberdashers' Company School, entering Guy's Hospital, where he qualified with honours in 1892. He was house surgeon there and pathologist to the East London Hospital for Children, but did not remain on the staff of a general hospital. Later he became physician to the Mount Vernon Hospital for Consumption, consulting physician to the National Union of Teachers, to the Post Office Sanatorium Society, to the Association of Local Government Officers, and, for chest cases, to the Prince of Wales's Hospital for Officers at Marylebone. He was also a lecturer at the London School of Clinical Medicine. He was advisory physician to the National Sanatorium Association, a body concerned with the establishment and maintenance of sanatoria for workers suffering from tuberculosis, and as chairman of its sites and buildings subcommittee he drafted the scheme for the Benenden Sanatorium. He was an invited member of the panel committee of the County of London and of the Hospital Fund Board of Delegates.

Lister was a man of many interests and of great industry, and it was surprising to his friends how much valuable work he contrived to carry out. One side of his bent is shown by his undertaking to edit (1912) a new edition of Chavasse's popular Advice to a Mother. He possessed a keen, incisive, logical mind with a definite mathematical bias, which no doubt helped to determine his interest in the problems of life insurance and the industrial aspects of disease, more particularly of tuberculosis. In both of these subjects Lister was a recognised authority; indeed, one of the foremost, as his writings prove. With originality and real vision he possessed a deep fount of common sense, which combined to render his views both suggestive and practical. The mere list of his appointments affords a measure of his special experience of the problems of tuberculosis, more particularly as they affect the community. He was a trenchant critic of commonly accepted views where they were not supported by clear and logical evidence. Two books dealing with industrial tuberculosis (1910) and sanatoria for the people (1911) illustrate this point. Although he was on the staff of one sanatorium and helped to draw up the scheme for another, he saw the weak points in the institutional treatment of this disease and worked hard to suggest remedies for them.

Lister's knowledge of the problems of life assurance was profound. He was one of the chief medical officers of three insurance offices. It was characteristic of him that he was not content to study the medical problems of life assurance only, but that he also endeavoured to get a grasp of the actuarial and the business aspects of this important subject. His presidential address before the Assurance Medical Society on March 3rd, 1920, was a thoughtful, original, and suggestive essay, indicating numerous lines for future investigation and research. In it he developed an ingenious idea of vital trajectories. In 1921 he published a book on the Medical Examination for Life Assurance, a handy and conveniently arranged volume, which has been of the greatest service to those working in this branch of medical practice. It is likely long to remain a standard manual on this subject. Unfortunately his health gave way shortly after its publication. "There can be

little doubt," writes one of his friends, "that the comparatively early death of his father and one of his brothers hung as a shadow over Lister's life, and this, together with the stress and anxiety of the war years, prevented its full fruition." He achieved much, but his untimely death has deprived the medical profession and the community at large of the greater gifts his original mind and wide experience were capable of yielding had he been spared.

Dr. A. T. Davies writes: "Lister was an accurate clinical observer and keen diagnostician and had an intuitive insight into the nature of disease. He possessed high intellectual qualities which he devoted unreservedly to the best interests of his profession and of his patients, indeed it is more than probable that his self-denying efforts and untiring devotion to his work at the Prince of Wales's Hospital for Officers intensified the beginnings of his long and fatal illness. He was a man who had friends and not acquaintances; his geniality of nature and kindness of disposition rendered him a genial host and companion."

Dr. Lister's death took place at Henley-on-Thames after a prolonged illness. He is survived by his widow, the only daughter of Eugen Ritter, and by two sons and a daughter.

Correspondence.

"Audi alteram partem."

MEASUREMENT OF ULTRA-VIOLET RADIATION.

To the Editor of THE LANCET.

SIR,—The standard colour-tubes of the acetone methylene-blue gauge for measuring ultra-violet rays, an account of which was published in THE LANCET of April 12th, 1924, were filled with graduated solutions of methylene-blue and water. Experience has shown that these fade with time and especially so in a warm climate. Mr. A. Webster has therefore made a new series of standards, using graduated pure copper nitrate solutions, and adding to the weaker ones of the series a certain amount of a solution of potassium chromate. These new standards have been matched against the grades of bleaching of our standard acetone methylene-blue solution exposed to light in our standard quartz tube, and these grades of bleaching in their turn have been standardised biologically against the time required for killing infusoria in a quartz cell and for producing erythema in a white skin. The new set of standards seem to work very satisfactorily and can be had of Messrs. Siebe Gorman, 187, Westminster Bridge-road, London, S.E.1, who supply the gauge in a convenient form. The utility of the gauge for measuring, not only dosage in light treatment, but also smoke pollution in cities, is illustrated by the following—from July 15th–20th the total ultra-violet reading was 78 at Peppard Common, Oxon., 60 at Hampstead, and 35 at the Meteorological Office, Kingsway, close to the Strand, London. The summer smoke-cloud thus robbed London of more than half its ultra-violet rays.

In making such measurements the quartz tube must be exposed in the vertical position on a roof with unrestricted view of the sky on all sides, or in an open space with such view, because far more ultra-violet rays come from the sky-shine than from the direct sunlight in the course of 24 hours. On bright summer days the tube requires changing twice and even thrice in the day, for the standard tubes only give 8° of the scale and the reading at Peppard in one day has been as high as 23. To measure smoke pollution one reading should be taken on a roof in the centre of the city and another in the country outside. To assist in the prevention of smoke pollution I would ask the medical officers of our cities to join in the taking of these observations and to send their measurements to me each month.

I am, Sir, yours faithfully,

LEONARD HILL.

National Institute for Medical Research, Hampstead,
London, N.W., July 30th, 1924.

INSULIN DOSAGE.

To the Editor of THE LANCET.

SIR,—I have read Prof. Murray Lyon's article on insulin in your issue of July 26th with great interest and appreciation, but I doubt if his plan of administering insulin two hours before meals will meet with general favour for several reasons.

In the first place, and very important, it is impracticable and inconvenient to give insulin as long as two hours before meals. It is no negligible hardship for a diabetic to have to get up two hours before breakfast to administer his dose. The nearer his life approximates to the normal the more likely he is to adhere strictly to his treatment and benefit from it.

Secondly, this plan seems unnecessary and sometimes even dangerous. Certainly there is little or no danger with the high fasting blood levels (0·2–0·3 per cent.) of Prof. Lyon's cases. But surely it is generally agreed that lower figures than these should be aimed at and can easily be obtained even in severe cases by less liberal diets of 1800 to 2100 calories (i.e., 30 cals. per kg. of body-weight) than the 2500–2800 calories (40 cals. per kg.) advocated by Prof. Lyon. 30 cals. per kg. is usually ample to meet the requirements of ordinary life and to maintain stable weight, because the body learns metabolic economy on such diets. The fasting blood-sugar can be kept more normal (0·12–0·15 per cent.) with less insulin and giving the dose half an hour before meals adequately controls glycosuria and prevents any but the slightest post-absorptive rise in blood-sugar if the dosage and the diet are properly balanced. It would be dangerous and unnecessary to give such a case insulin two hours before breakfast. With a diet liberal in carbohydrates or even total calories it is difficult or impossible to avoid fasting hyperglycæmia in severe cases with little endogenous insulin, as any excess of carbohydrate unburned by insulin is stored to reappear later in the blood when the effects of the dose wears off. Leaving aside the question of the bad effects of hyperglycæmia per se, such a plan requires more insulin to control even the glycosuria, and wide oscillations in the range of blood-sugar concentration must occur. In Fig. 2 Prof. Lyon hardly proves his point, for the observations cease two hours after breakfast with equal blood-sugars. True, he obtains lower blood-sugars before and immediately after breakfast, but the probability is that correspondingly higher figures would have been obtained in the afternoon when insulin was given two hours rather than half an hour before breakfast. Again, it would seem better to keep a case on a constant satisfactory balance of insulin and diet than to correct a "luxus" diet by cutting it down to half one day a week. The latter is an irksome complication in the diabetic's life and likely to lead to mistakes and hypoglycæmic symptoms.

I am glad to hear Prof. Lyon definitely state the variation he has found in batches of insulin. I have found the same in all the makes I have tried, though Lilley insulin seems to vary least in therapeutic action. This is serious enough from the therapeutic point of view, but still more so from the research standpoint, as it renders invalid any careful attempt in the last year to follow improvement or aggravation of insulin cases over long periods.

I am, Sir, yours faithfully,

R. D. LAWRENCE,
Chemical Pathologist, King's College Hospital.
August 1st, 1924.

the families concerned. Water-supplies and sinks are convenient and a large laundry provides ample facilities for washing purposes. Gas-stoves on the slot principle have been provided for cooking purposes.

Dr. Marion B. Andrews, the maternity and child welfare medical officer, reports a growth in the utilisation of home-helps, in the provision of dinners, and in the dental work. Where possible the provision of dinners for pregnant and nursing women is preferred, as being less likely to be diverted from its destined end than the issue of milk. The dinners are organised by the Infant Health Society, which, as Dr. Andrews tells us, is responsible for a great deal of valuable work. The rule is made that mothers pay £3 towards the cost of dentures, and it is pointed out that this charge is a serious obstacle for the mothers of families who are on the 'free-scale' in other respects. The limit of the 'free-scale' is a family income of 6*s.* per head, and, as Dr. Andrews puts it, the prospect of saving 60*s.* in a reasonable time on such an income is extremely remote. Nearly half the infant deaths were attributed to prematurity, and took place during the first fortnight of life. Dr. Andrews thinks these babies are usually washed and fed as normal children and some endeavours are now being made to meet their peculiar needs by stocking supplies of cotton-wool and olive oil for the use of the midwives. Classes for mothers have made progress, and the experiments of setting simple examination on mothercraft subjects has proved a success.

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Obituary.

THOMAS DAVID LISTER, C.B.E., M.D., B.S., M.R.C.P. LOND., F.R.C.S. ENG.,

CONSULTING PHYSICIAN, PRINCE OF WALES'S HOSPITAL FOR CONVALESCENT OFFICERS, MARYLEBONE, AND TO THE ASSOCIATION OF LOCAL GOVERNMENT OFFICERS.

We regret to announce the death on July 30th of Dr. T. D. Lister, whose work in connexion with tuberculosis and with life assurance problems was of high value. Born in London on Jan. 30th, 1869, the son of Francis Wilson Lister and Elizabeth Wishart, only daughter of David Roy, of Glasgow, he received his early education at the Haberdashers' Company School, entering Guy's Hospital, where he qualified with honours in 1892. He was house surgeon there and pathologist to the East London Hospital for Children, but did not remain on the staff of a general hospital. Later he became physician to the Mount Vernon Hospital for Consumption, consulting physician to the National Union of Teachers, to the Post Office Sanatorium Society, to the Association of Local Government Officers, and, for chest cases, to the Prince of Wales's Hospital for Officers at Marylebone. He was also a lecturer at the London School of Clinical Medicine. He was advisory physician to the National Sanatorium Association, a body concerned with the establishment and maintenance of sanatoria for workers suffering from tuberculosis, and as chairman of its sites and buildings subcommittee he drafted the scheme for the Benenden Sanatorium. He was an invited member of the panel committee of the County of London and of the Hospital Fund Board of Delegates.

Lister was a man of many interests and of great industry, and it was surprising to his friends how much valuable work he contrived to carry out. One side of his bent is shown by his undertaking to edit (1912) a new edition of Chavasse's popular Advice to a Mother. He possessed a keen, incisive, logical mind with a definite mathematical bias, which no doubt helped to determine his interest in the problems of life insurance and the industrial aspects of disease, more particularly of tuberculosis. In both of these subjects Lister was a recognised authority; indeed, one of the foremost, as his writings prove. With originality and real vision he possessed a deep fount of common sense, which combined to render his views both suggestive and practical. The mere list of his appointments affords a measure of his special experience of the problems of tuberculosis, more particularly as they affect the community. He was a trenchant critic of commonly accepted views where they were not supported by clear and logical evidence. Two books dealing with industrial tuberculosis (1910) and sanatoria for the people (1911) illustrate this point. Although he was on the staff of one sanatorium and helped to draw up the scheme for another, he saw the weak points in the institutional treatment of this disease and worked hard to suggest remedies for them.

Lister's knowledge of the problems of life assurance was profound. He was one of the chief medical officers of three insurance offices. It was characteristic of him that he was not content to study the medical problems of life assurance only, but that he also endeavoured to get a grasp of the actuarial and the business aspects of this important subject. His presidential address before the Assurance Medical Society on March 3rd, 1920, was a thoughtful, original, and suggestive essay, indicating numerous lines for future investigation and research. In it he developed an ingenious idea of vital trajectories. In 1921 he published a book on the Medical Examination for Life Assurance, a handy and conveniently arranged volume, which has been of the greatest service to those working in this branch of medical practice. It is likely long to remain a standard manual on this subject. Unfortunately his health gave way shortly after its publication. "There can be

little doubt," writes one of his friends, "that the comparatively early death of his father and one of his brothers hung as a shadow over Lister's life, and this, together with the stress and anxiety of the war years, prevented its full fruition." He achieved much, but his untimely death has deprived the medical profession and the community at large of the greater gifts his original mind and wide experience were capable of yielding had he been spared.

Dr. A. T. Davies writes: "Lister was an accurate clinical observer and keen diagnostician and had an intuitive insight into the nature of disease. He possessed high intellectual qualities which he devoted unreservedly to the best interests of his profession and of his patients, indeed it is more than probable that his self-denying efforts and untiring devotion to his work at the Prince of Wales's Hospital for Officers intensified the beginnings of his long and fatal illness. He was a man who had friends and not acquaintances; his geniality of nature and kindness of disposition rendered him a genial host and companion."

Dr. Lister's death took place at Henley-on-Thames after a prolonged illness. He is survived by his widow, the only daughter of Eugen Ritter, and by two sons and a daughter.

Correspondence.

"Audi alteram partem."

MEASUREMENT OF ULTRA-VIOLET RADIATION.

To the Editor of THE LANCET.

SIR,—The standard colour-tubes of the acetone methylene-blue gauge for measuring ultra-violet rays, an account of which was published in THE LANCET of April 12th, 1924, were filled with graduated solutions of methylene-blue and water. Experience has shown that these fade with time and especially so in a warm climate. Mr. A. Webster has therefore made a new series of standards, using graduated pure copper nitrate solutions, and adding to the weaker ones of the series a certain amount of a solution of potassium chromate. These new standards have been matched against the grades of bleaching of our standard acetone methylene-blue solution exposed to light in our standard quartz tube, and these grades of bleaching in their turn have been standardised biologically against the time required for killing infusoria in a quartz cell and for producing erythema in a white skin. The new set of standards seem to work very satisfactorily and can be had of Messrs. Siebe Gorman, 187, Westminster Bridge-road, London, S.E.1, who supply the gauge in a convenient form. The utility of the gauge for measuring, not only dosage in light treatment, but also smoke pollution in cities, is illustrated by the following—from July 15th–20th the total ultra-violet reading was 78 at Peppard Common, Oxon., 60 at Hampstead, and 35 at the Meteorological Office, Kingsway, close to the Strand, London. The summer smoke-cloud thus robbed London of more than half its ultra-violet rays.

In making such measurements the quartz tube must be exposed in the vertical position on a roof with unrestricted view of the sky on all sides, or in an open space with such view, because far more ultra-violet rays come from the sky-shine than from the direct sunlight in the course of 24 hours. On bright summer days the tube requires changing twice and even thrice in the day, for the standard tubes only give 8° of the scale and the reading at Peppard in one day has been as high as 23. To measure smoke pollution one reading should be taken on a roof in the centre of the city and another in the country outside. To assist in the prevention of smoke pollution I would ask the medical officers of our cities to join in the taking of these observations and to send their measurements to me each month.

I am, Sir, yours faithfully,

LEONARD HILL.

National Institute for Medical Research, Hampstead,
London, N.W., July 30th, 1924.

INSULIN DOSAGE.

To the Editor of THE LANCET.

SIR,—I have read Prof. Murray Lyon's article on insulin in your issue of July 26th with great interest and appreciation, but I doubt if his plan of administering insulin two hours before meals will meet with general favour for several reasons.

In the first place, and very important, it is impracticable and inconvenient to give insulin as long as two hours before meals. It is no negligible hardship for a diabetic to have to get up two hours before breakfast to administer his dose. The nearer his life approximates to the normal the more likely he is to adhere strictly to his treatment and benefit from it.

Secondly, this plan seems unnecessary and sometimes even dangerous. Certainly there is little or no danger with the high fasting blood levels (0·2–0·3 per cent.) of Prof. Lyon's cases. But surely it is generally agreed that lower figures than these should be aimed at and can easily be obtained even in severe cases by less liberal diets of 1800 to 2100 calories (i.e., 30 cals. per kg. of body-weight) than the 2500–2800 calories (40 cals. per kg.) advocated by Prof. Lyon. 30 cals. per kg. is usually ample to meet the requirements of ordinary life and to maintain stable weight, because the body learns metabolic economy on such diets. The fasting blood-sugar can be kept more normal (0·12–0·15 per cent.) with less insulin and giving the dose half an hour before meals adequately controls glycosuria and prevents any but the slightest post-absorptive rise in blood-sugar if the dosage and the diet are properly balanced. It would be dangerous and unnecessary to give such a case insulin two hours before breakfast. With a diet liberal in carbohydrates or even total calories it is difficult or impossible to avoid fasting hyperglycæmia in severe cases with little endogenous insulin, as any excess of carbohydrate unburned by insulin is stored to reappear later in the blood when the effects of the dose wears off. Leaving aside the question of the bad effects of hyperglycæmia per se, such a plan requires more insulin to control even the glycosuria, and wide oscillations in the range of blood-sugar concentration must occur. In Fig. 2 Prof. Lyon hardly proves his point, for the observations cease two hours after breakfast with equal blood-sugars. True, he obtains lower blood-sugars before and immediately after breakfast, but the probability is that correspondingly higher figures would have been obtained in the afternoon when insulin was given two hours rather than half an hour before breakfast. Again, it would seem better to keep a case on a constant satisfactory balance of insulin and diet than to correct a "luxus" diet by cutting it down to half one day a week. The latter is an irksome complication in the diabetic's life and likely to lead to mistakes and hypoglycæmic symptoms.

I am glad to hear Prof. Lyon definitely state the variation he has found in batches of insulin. I have found the same in all the makes I have tried, though Lilley insulin seems to vary least in therapeutic action. This is serious enough from the therapeutic point of view, but still more so from the research standpoint, as it renders invalid any careful attempt in the last year to follow improvement or aggravation of insulin cases over long periods.

I am, Sir, yours faithfully,

R. D. LAWRENCE,

Chemical Pathologist, King's College Hospital.

August 1st, 1924.

the families concerned. Water-supplies and sinks are convenient and a large laundry provides ample facilities for washing purposes. Gas-stoves on the slot principle have been provided for cooking purposes.

Dr. Marion B. Andrews, the maternity and child welfare medical officer, reports a growth in the utilisation of home-helps, in the provision of dinners, and in the dental work. Where possible the provision of dinners for pregnant and nursing women is preferred, as being less likely to be diverted from its destined end than the issue of milk. The dinners are organised by the Infant Health Society, which, as Dr. Andrews tells us, is responsible for a great deal of valuable work. The rule is made that mothers pay £3 towards the cost of dentures, and it is pointed out that this charge is a serious obstacle for the mothers of families who are on the 'free-scale' in other respects. The limit of the 'free-scale' is a family income of 6*s.* per head, and, as Dr. Andrews puts it, the prospect of saving 60*s.* in a reasonable time on such an income is extremely remote. Nearly half the infant deaths were attributed to prematurity, and took place during the first fortnight of life. Dr. Andrews thinks these babies are usually washed and fed as normal children and some endeavours are now being made to meet their peculiar needs by stocking supplies of cotton-wool and olive oil for the use of the midwives. Classes for mothers have made progress, and the experiments of setting simple examination on mothercraft subjects has proved a success.

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years and found themselves at the age of 70 precluded from further participation in the benefits of the fund; and whether he could take steps to enable them to continue to participate especially in the cases of those ineligible for old age pensions.—Mr. Wheatley replied: The National Health Insurance Acts provide that the liability to pay contributions and the title to sickness and disablement benefits (but not to medical benefit) cease on an insured person attaining the age of 70, and I have no evidence that this feature of the scheme has been the cause of great dissatisfaction. The extension of sickness and disablement benefits to persons over 70, which could only be effected by amending legislation, would necessitate an increase in the weekly contributions, and would present serious administrative difficulties to approved societies in the application of the test of incapacity for work.

Kingston Vaccination Case.

Mr. Black asked the Minister of Health whether he would inquire into the costs claimed in the case brought by the Kingston vaccination officer against Mr. Barnet Marks, of St. Mark's Hill, Surbiton, for neglecting to have his child vaccinated, when the costs amounted to £1 11*s.* 6*d.*, compared with 6*s.* or 7*s.* in most similar cases brought by other vaccination officers; and whether he would see that the Kingston vaccination officer did not in future put vaccination defaulters to unnecessary expense in the matter of court costs.—Mr. Wheatley replied: I have inquired into this case, and am informed that the circumstances were unusual. I have no reason to believe that this vaccination officer puts defaulters to unnecessary expense in the matter of costs.

Local Authorities and Birth Control.

Mr. Thurtle asked the Minister of Health if he would consider the desirability of allowing local authorities to impart to people who wished to obtain it information as to birth control methods without penalising such local authorities by withdrawing their maternity and child welfare grants.—Mr. Wheatley replied: My view is that the institutions provided by local authorities at the cost of public funds should not be used for purposes such as that referred to in the question, which are the subject of controversy, without an express direction from Parliament.

Use of Pyridine in Methylated Spirit.

Mr. Lorimer asked the Chancellor of the Exchequer if, as methylated spirit was extensively used in surgery, and was one of the best sterilisers of the skin and of instruments, it had been brought to his notice that the addition of the new denaturant, pyridine, had a harmful effect upon the skin of the hands of surgeons and the skin of patients; and, if so, would he, in the interests of surgeons and patients, have the order to add pyridine to methylated spirit removed.—Mr. Graham (Financial Secretary to the Treasury) replied: The question raised by the hon. Member is at present under investigation.

THURSDAY, JULY 31ST.

Pensions Medical Officers and Overseas Service.

Lieut.-Colonel Fremantle asked the Minister of Pensions how many medical officers who had never served overseas were at present employed by the Ministry of Pensions among those serving on a whole-time agreement, including administrative officers, and among those serving on a sessional basis, respectively.—Mr. F. O. Roberts replied: 115 out of the 400 full-time medical officers, and 644 out of the 2408 sessional medical officers in the Ministry of Pensions did not serve overseas. I may add that nearly 94 per cent. of these medical officers have served either at home or abroad.

Lieut.-Colonel Fremantle asked the Minister of Pensions if he would state how many medical officers who have served overseas had been discharged from work under the Ministry of Pensions in the last six months in order to retain the services of doctors who had not served overseas.—Mr. F. O. Roberts replied: No medical officer with overseas service has been discharged in order to provide for another officer without overseas service. In selecting medical officers for discharge, which is unavoidable owing to the continued decline in the work of the Ministry of Pensions, full regard is paid to war service and to the qualifications required for the work to be performed.

Clothing for Sanatorium Patients.

Captain Elliot asked the Minister of Pensions whether any allowance was made for clothing for outdoor work for patients admitted to sanatoriums; and, if not, whether he would give instructions that such allowance should be made, since, in view of the current distress in many parts of the country, the provision of the necessary outfit imposed a serious charge upon the pensioner.—Mr. F. O. Roberts replied: The arrangements for the residential treatment of tuberculosis for both ex-Service men and others are in the hands of the local health authorities, subject to the general direction of the Ministry of Health. I understand that such treatment does not ordinarily involve any special expense to the patient. I may add, however, that if a pensioner desires to provide himself with additional clothing, arrangements have been made for the purchase of it by way of advance out of the personal allowance which accrues to the pensioner during his treatment.

Pensions for Tuberculous Patients.

Captain Elliot asked the Minister of Pensions whether the pensions for tuberculous patients were reduced after the discharge of the patient from the sanatorium for the second time to 40 per cent.; and whether he would give instructions that it should be 100 per cent. for six months as in the case of dismissal for the first time.—Mr. F. O. Roberts replied: There is no general rule in operation to the effect stated in the first part of the question. On discharge from a sanatorium for the second or any subsequent period of treatment a patient is given the pension at the rate of assessment which is found by a medical board to be appropriate to his condition, unless he is still eligible for the special rates of pension available for a certain period in cases of tuberculosis. These special rates of pension, which are at the rate of 100 per cent. for the six months after discharge following the first period of treatment in a sanatorium or training centre, and not less than 50 per cent. for the succeeding two years, were designed as a special measure for the assistance of cases in the earliest stages of the disease. Apart from the period of two and a half years in which these rates apply, cases of tuberculosis have to be dealt with under the general provisions of the warrant applicable to all classes of disability.

Treatment of Tuberculous Pensioners.

Captain Elliot asked the Minister of Pensions whether the tuberculous pensioners in parochial sanatoriums received treatment on the full scale laid down by the Pensions Ministry; and, if not, whether he would give instructions that additional allowances be given to pensions Ministry patients to bring them individually up to this scale.—Mr. F. O. Roberts replied: I am not quite clear what class of institution the hon. and gallant Member has in mind; but I may say that whenever a course of residential treatment is prescribed by a tuberculosis medical officer for a condition accepted by the Ministry as due to or aggravated by war service, and such treatment is given in a sanatorium approved by the Ministry of Health, the allowances and other expenses authorised under Article 6 of the Royal Warrant are granted.

Morbid Details of Condemned Prisoners.

Mr. Penny asked the Home Secretary whether, in view of the publication in the press of morbid details relating to prisoners under sentence of death in His Majesty's prisons, he would issue instructions that in the event of officials giving such information to the press they would be liable to instant dismissal.—Mr. Davies (Under Secretary for the Home Office). replied: Any such communication is strictly prohibited by statutory Rule 115 (1), which lays down that any breach will render an officer liable to dismissal.

Nursing Service in Mental Hospitals.

Mr. Hobhouse asked the Minister of Health whether the departmental committee appointed to consider in what direction the nursing service in mental hospitals could be improved had yet reported; and, if so, what recommendation had been made concerning the present excessive hours of duty worked by members of the staff in these hospitals.—Mr. Wheatley replied: The report is now in the hands of the printer, and will be published as soon as practicable.

National Health Insurance Commission.

Sir Kingsley Wood asked the Minister of Health when the Royal Commission on National Insurance would commence its sittings; and whether its proceedings would be open to the public.—Mr. Wheatley replied: The Royal Commission on National Health Insurance has already held a preliminary meeting and will commence its sittings for the hearing of evidence in October. I am informed that the Commission has not yet arrived at a decision as to the admission of the public to its meetings.

MONDAY, AUGUST 4TH.

Accommodation for Consumptive Prisoners.

Mr. Stranger asked the Home Secretary whether he was aware that in the metropolitan prisons there were insufficient cells set apart for offenders suffering from tuberculosis and that, in consequence, such offenders were put in ordinary cells; and whether prompt steps could be taken to improve the accommodation for those suffering from this disease.—Mr. Davies replied: At Wandsworth, Wormwood Scrubbs, and Holloway, the number of special cells for tuberculous patients is in excess of requirements. At Pentonville and Brixton the number of tuberculous cases is often somewhat larger than the number of special cells. When this occurs the cases are either located in adjoining ordinary cells or are removed to separate rooms in the hospital. In all cases alike the patient receives the appropriate treatment. It is, in fact, proposed to provide additional special cells without avoidable delay.

Indian Wool and Anthrax Infection.

Colonel PERKINS asked the Home Secretary whether he was satisfied that the provision of a disinfecting station at Liverpool was the best means of protecting British workers against infection from material which contained the germs of anthrax; and whether, seeing that this disinfecting station could not possibly protect dock workers handling such material, he would undertake to explore thoroughly the first means of protection suggested by general conference of the International Labour Organisation of the League of Nations, 1919—viz., the disinfection of material infected with anthrax spores in the country exporting such material. —Mr. HENDERSON replied: The Home Office has throughout been fully alive to the desirability of arranging, if practicable, for disinfection in the country of export; and with this object in view, immediately after the Home Office committee on anthrax reported in 1918, representations were made to the Government of India, from which country the greater part of the infected material comes. The Government of India, however, have not seen their way to arrange for disinfection in India, and we have therefore been thrown back on the alternative of providing for disinfection at the port of entry in this country. Under the arrangements in force at Liverpool the material is conveyed direct from the ship to the disinfecting station, so that the risk to the dock workers is reduced to a minimum.

TUESDAY, AUGUST 5TH

National Health Insurance Bill.

The National Health Insurance Bill, a consolidating measure which has already passed the House of Lords, went through Committee without amendment.

On the motion for the third reading,

Sir KINGSLEY WOOD congratulated the Government on getting this Bill through so expeditiously. It would be of considerable advantage to the approved societies.

Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) said that the reason why the Bill was being pressed forward before the recess was on account of the regulations. It was the intention that the regulations should be completed in order to come into operation on Jan. 1st, 1925.

Lieut.-Colonel FREMANTLE said he wished to say from the point of view of medical men that this Consolidation Bill was of serious importance as regarded the efficiency of the operation of National Insurance. He trusted that the approved societies would realise more fully from this Bill what they could do under the law and what they had not already done. There were various measures of prevention which ought to be carried out, and he hoped that steps would be taken to bring these important preventive measures into operation in the interests of the health of the community.

The Bill was read a third time.

Workmen's Compensation (Silicosis) Bill.

Mr. R. DAVIES (Under Secretary to the Home Office) in moving the second reading of the Workmen's Compensation (Silicosis) Bill, which has passed through the House of Lords, said that under the existing scheme workmen's compensation could not be paid in cases where men were suffering from both silicosis and tuberculosis. This Bill proposed that compensation should be paid in such cases. It was an agreed measure. Medical men who had made a study of this problem had not been able to draw the line where silicosis ended and tuberculosis began.

Lieut.-Colonel FREMANTLE supported the Bill as a right and reasonable extension of the law in this connexion.

The Bill was read a second time.

PRINCE OF WALES'S HOSPITAL, TOTTENHAM.—Following upon the resignation of Mr. J. B. Banister from the post of gynæcologist to the Prince of Wales's Hospital on his appointment to the Charing Cross Hospital, the governors have invited Mr. Arthur Giles, consulting gynæcologist to the hospital, to resume active work on the staff as senior gynæcologist, and have appointed Mr. Aubrey Goodwin as gynæcologist.

DONATIONS AND BEQUESTS.—Mr. Lewis Loughor, a South Wales shipowner, has given £10,000 worth of Conversion Loan to the King Edward VII. Hospital, Cardiff.—Major Peake, of Bawtry Hall, chairman of the Airedale Collieries Company, has offered to the Castleford, Normanton, and District Cottage Hospital Committee £10,000 to build a ward in memory of his son, who was killed on the Somme.—By the will of the late Mr. Joseph Isaac Hallam, of Leicester, the testator left £1000 to the Leicester Infirmary for the endowment of a J. I. Hallam bed.—Lord Bearsted having offered to give £5000 to St. Thomas's Hospital funds on condition that four others give a similar amount, Mr. Frederick Lane has promised to be one of the four.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary quarterly Comitia of the College was held on July 31st. The President, Sir Humphry Rolleston, occupied the chair. The following were admitted to the Membership:—

Drs. Richard S. Allison, Walter R. Brain, Walter F. R. Castle, Alexander Cawadias, Philip C. P. Cloake, Keith D. Fairley, Charles B. S. Fuller, Eric F. Gartrell, Frank B. Hobbs, Charles J. Lewis, Samuel L. Ludbrook, Arthur A. Osman, Martin O. Raven, Carl I. Streich, Eric L. Susman, Geoffrey W. Theobald, and James G. Willmore.

Licences to practise Physic were granted to 208 candidates who had passed the required examinations after conforming to the by-laws and regulations.—Diplomas were granted, jointly with the Royal College of Surgeons of England, in the following subjects, to 31 candidates in Public Health, to 17 candidates in Tropical Medicine and Hygiene, to 5 candidates in Psychological Medicine, to 14 candidates in Ophthalmic Medicine and Surgery, and to 5 candidates in Laryngology and Otology. The names of the successful candidates are given below.

Mr. Norman William Smith was awarded the Murchison Scholarship.

On the nomination of the President, the Council and the Library Committee, the following College officers, members of committees, and examiners were elected for the ensuing year:—

Censors.—Dr. Horace George Turney, Dr. Edward Farquhar Buzzard, Dr. James Calvert, and Dr. Cyril Ogle.

Emeritus Treasurer.—Sir Dyce Duckworth.

Treasurer.—Dr. Sidney Philip Phillips.

Registrar.—Dr. Joseph Arderne Ormerod.

Harveian Librarian.—Dr. T. H. Arnold Chaplin.

Members of the Library Committee.—Dr. Frederick Parkes Weber, Dr. Herbert Spencer, Dr. William Cecil Bosanquet, and Dr. Charles Joseph Singer.

Curators of the Museum.—Dr. John Mitchell Bruce, Sir Seymour John Sharkey, Sir Frederick W. Andrewes, and Dr. William Hunter.

Finance Committee.—Dr. Raymond H. P. Crawfurd, Dr. Arthur George Phear, and Dr. Frederick John Poynton.

Examiners.—Chemistry: Mr. Charles Stanley Gibson and Dr. Robert Henry Aders Plimmer. Physics: Dr. William Edward Curtis and Dr. Sidney Russ. Practical Pharmacy: Dr. Alfred Ernest Russell, Dr. Edward Alfred Cockayne, Dr. Philip Hamill, Dr. Nathan Mutch, and Dr. Walter Ernest Dixon. Physiology: Dr. John Beresford Leathes and Dr. John Mellanby. Anatomy: Dr. Thomas Baillie Johnston. Medical Anatomy and Principles and Practice of Medicine: Dr. Herbert Morley Fletcher, Dr. Arthur Philip Beddard, Dr. William Cecil Bosanquet, Dr. James William Russell, Dr. Charles Richard Box, Sir James Purves-Stewart, Dr. Charles Bolton, Dr. Lewis Albert Smith, Sir John Charlton Briscoe, and Dr. James Aubrey Torrens. Midwifery and Diseases Peculiar to Women: Dr. John Prescott Hedley, Sir Ewen John Maclean, Dr. Thomas George Stevens, Dr. John Davis Barris, and Dr. Henry John Forbes Simson.

Public Health.—Part I.: Dr. Henry Wilson Hake. Part II.: Dr. David Samuel Davies.

Tropical Medicine.—Sir Percy William Bassett-Smith (Bacteriology), Sir Leonard Rogers (Diseases and Hygiene of the Tropics).

Ophthalmic Medicine and Surgery.—Dr. James Stansfield Collier.

Laryngology and Otology.—Sir StClair Thomson.

Psychological Medicine.—Part I.: Dr. Eric Danvers Macnamara. Part II.: Dr. Robert Percy Smith and Dr. C. M. Hinds Howell.

Communications were received from (1) Mr. C. F. Rey on behalf of His Highness Tafari Makonnen, the Regent of Ethiopia, expressing his appreciation of his visit to the College and sending a commemorative medal in memory of it. (2) The secretaries of the committee for the Study of Medical Hydrology in Great Britain (Drs. Edgecombe and Fortescue Fox), asking the support of the College for the aims and work of the Committee, and submitting certain representations on the subject which have been laid before the Ministry of Health. (3) The Home Office, asking the College to suggest names for filling a vacancy which has occurred, through the resignation of Sir Bryan Donkin, on the Advisory Committee on the administration of the Cruelty to Animals Act. (4) The University of Leeds asking the College to send representatives to the celebration of its coming of age and the jubilee of the Yorkshire College, Leeds.

The President brought before the College the results of communications with (1) the Home Office, concerning veronal. (2) The Ministry of Health, concerning heroin. A report, by Sir William Hale-White and Sir William Willcox, on the question of the prohibition or the limitation of the manufacture of heroin, was read. It was resolved on the recommendation of the Council that the Moxon medal be awarded to Sir Leonard Rogers. The Weber-Parkes prize and medal was awarded to Prof. Calmette.

Dr. Sidney Martin and Sir Arthur Newsholme were re-elected representatives on the Executive Committee of the Cancer Research Fund.

The President announced that he had appointed Sir Frederick Mott, F.R.S., to deliver the Harveian oration in 1925.

A report was received from the representative of the College on the General Medical Council.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At meetings of the Royal Colleges of Physicians and Surgeons on July 31st diplomas of L.R.C.P. and M.R.C.S. were conferred upon 208 candidates (188 men and 20 women) who have passed the Final Examination in Medicine, Surgery and Midwifery of the Conjoint Board, and have complied with the respective by-laws. The following are the names and medical schools of the successful candidates:—

H. E. Acheson, Royal Free; B. E. Ahrens, Cambridge and King's Coll.; N. J. Ainsworth, Middlesex; H. M. Allen, McGill; G. Anderton, St. Mary's; E. C. Archer, St. Thomas's; F. H. Armanious, Cairo and St. Thomas's; R. N. Aston and A. E. Austen, St. Bart.'s; J. M. Barnard, Charing Cross; E. V. Barnes, St. Thomas's; A. Barnsley, St. Bart.'s; J. C. Barrett, St. Thomas's; I. M. Benjamin, Guy's; T. P. Beswetherick, St. Thomas's; F. A. Bevan, St. Bart.'s; H. M. Bird, Middlesex; R. Bolton, St. Bart.'s; W. R. Bowen, Middlesex; A. D. Briscoe, Cambridge and St. Thomas's; Eileen M. Bronson, King's Coll.; A. C. Brown, Cambridge and St. Bart.'s; D. M. Brown, Birmingham; Doris D. Brown, Royal Free and St. Mary's; R. K. Bryce, London; H. F. Burtt, Birmingham; G. A. H. Buttle, Cambridge and Univ. Coll.; Doris M. E. Carrington, Birmingham; M. N. Chatterjee, Calcutta and Birmingham; F. E. Chester-Williams, St. Bart.'s; Edith I. Clark, Univ. Coll.; C. K. Colwill, Cambridge and Guy's; A. Cooke, Liverpool; H. A. Cooper, King's Coll.; J. D. Craig, Liverpool; S. H. Currie, London; D. D. R. Dale, St. Bart.'s; Agnes S. Daniel, Royal Free and St. Mary's; Edith M. Davies, Cardiff; J. Davies and Muriel Davies, Westminster; V. H. J. Davies, Charing Cross; S. C. Davison, Guy's; R. Y. Dawbarn, Liverpool; Ursula H. De Foubert, Royal Free; M. De Lacey, Cardiff and London; J. A. F. Denyssen, Cape and Guy's; D. M. de Silva, King's Coll.; A. C. Dick, St. Bart.'s; J. C. G. Dickinson, Guy's; C. P. Donnison, London; R. H. Dyer, Cambridge and King's Coll.; C. J. East and H. E. K. Eccles, St. Bart.'s; A. B. Eddowes, Cambridge and St. George's; J. E. Elam, Cambridge and St. Bart.'s; Dorothy K. Elliott, Birmingham; M. N. Emery, Basle and Univ. Coll.; Phyllis V. L. Epps, Royal Free; H. G. Estcourt, Middlesex; T. I. Evans, Cambridge and St. Thomas's; T. P. Evans, Charing Cross; A. Farid, Cairo and Guy's; D. W. G. Faris, London; C. W. S. Fernando, Univ. Coll.; W. W. J. Fernando, Middlesex; H. R. Fisher, Liverpool; F. G. France, St. Bart.'s; H. J. Fuller, Guy's; Florence M. Gamble, Royal Free; A. G. D. Gavin, Cambridge and St. Thomas's; W. T. M. Gentle, St. Mary's; W. H. Gervis, Cambridge and St. Thomas's; G. Gillett, Univ. Coll.; A. Glen, London; I. Gluckman, London; P. L. Goitein, St. Mary's; F. M. Graham, Madras and King's Coll.; P. L. Gray and W. H. Gray, Univ. Coll.; S. J. H. Griffiths, Bristol; G. E. Harries and J. Hartsilver, St. Bart.'s; H. Hinchco, Middlesex; R. C. Howard, St. George's; Dorothy M. Howse, Univ. Coll.; J. N. Hudson, Manchester; G. C. Hughes, Guy's; R. G. W. Husbands, Univ. Coll.; A. G. Hyde, Sheffield; M. H. Jacobs, Guy's; Bessie G. Jemson, London; C. M. Jennings, St. Bart.'s; A. J. R. F. Johnson, St. Thomas's; D. J. Jones, Cardiff and St. Thomas's; E. L. H. Jones, Leeds; R. W. Jones and R. C. Jones, Liverpool; A. Jowell, Cape and Guy's; D. E. Keefe, London; M. C. H. Kingdon, Cambridge and St. Mary's; I. Kinsler, A. H. Kynaston, and J. H. R. Laptain, St. Bart.'s; W. C. Latham, Liverpool; J. J. Laws and S. A. Leader, Guy's; H. Levit, Cape and Guy's; F. J. Levy, Guy's; Nancy R. Lewis, St. Mary's; E. M. Liddle, Manchester; W. R. A. Line, Birmingham; Rosalie E. Lucas, Bristol; H. J. McCarthy and J. McCunn, London; A. F. McGlashan, Cambridge and St. George's; G. A. McKaig, St. Thomas's; A. V. Mackenzie, Cambridge and St. Bart.'s; R. S. MacLatchy, Dalhousie and London; J. R. Maleri, Punjab and St. George's; H. B. Mann, Cape and Middlesex; R. G. B. Marsh, St. Thomas's; D. J. Martin, London; F. Martin and G. A. Martin, Guy's; R. Massingham, Univ. Coll.; J. H. Matthews, Manchester; L. M. Maybury, Cambridge and Univ. Coll.; B. A. J. Mayo, St. Bart.'s; T. F. Meyrick, King's Coll.; K. V. Milburn, Durham; W. J. Montague, Cambridge and Guy's; J. H. Moore and J. G. Morgan, Univ. Coll.; L. Morris, Manchester; C. J. Murphy, Birmingham; J. W. Nankivell, Middlesex; M. C. O'Connor, St. George's; J. O. Oliver, St. Thomas's; F. C. O'Mara, Liverpool; Helen E. D. E. Ornstein, King's Coll.; K. C. L. Paddle, St. Bart.'s; L. J. Panting, Cambridge and Middlesex; H. R. Paterson, Cambridge and St. Thomas's; Dorothy E. Peake, London; A. A. F. Peel, Oxford and St. Bart.'s; M. S. Pembrey, St. Bart.'s; D. B. Phillips and L. M. J. R. Pilot, St. Thomas's; G. H. Pitt, Guy's; L. Platzky, Cape and Middlesex; H. G. Poles, Charing Cross; A. Pool, Liverpool; Gwendolen M. Pratt, Royal Free; J. O. Priestley, Middlesex; V. J. Rao, London; W. E. Rees, St. Thomas's; H. D. C. Rice, Cambridge and King's Coll.; Jessie L. Robb, Birmingham; W. A. Robb, St. Bart.'s; Lilian E. Robinson, Univ. Coll.; W. E. Rodgers, Madras and London; G. R. Rolston, London; F. W. Roques, Cambridge and Middlesex; E. Scott and J. A. Scott, Liverpool; S. J. Scurlock, London; E. K. Seab, Hong-Kong and King's Coll.; J. Sellick, Guy's; A. Shirley, Cambridge and St. Thomas's; A. D. H. Simpson, St. Bart.'s; A. W. H. Smith, Cardiff and St. Bart.'s; Jean L. Smith, Cardiff and Charing Cross; K. S. M. Smith, St. Bart.'s; J. F. Southward, Bristol; H. L. Sparrow, Cambridge and King's Coll.; C. E. Stainthorpe, Durham; E. V. Suckling, London; F. S. Tait, Birmingham; C. Thomas, London; D. M. E. Thomas, St. Mary's; O. F. Thomas, Manchester; O. O. S. Thomas, St. Mary's; W. D. R. Thompson, St. Thomas's; D. S. Todd-White, Guy's; G. M. Tothill, Charing Cross; J. R. Tree, Middlesex; L. A. S. Trott, Guy's; C. A. Van Rooyen, Ceylon and London; G. C. Vaughan, Birmingham and London; I. R. Vermooten, Guy's; F. O. Walker, Middlesex; J. L. le C. Walker, Guy's; H. A. Ware, Cambridge and St. Bart.'s; H. C. Warner, Guy's; R. L. Washington, Birmingham; H. O. Watkins-Pitchford, St. Thomas's; A. Watson, St. Mary's; B. M. R. West, Middlesex; V. E. Whitman, Cardiff; Mary A. Wiles, King's Coll.; W. Wilkinson, St. Bart.'s; R. G. Williams, Guy's; V. G. Williams, Birmingham; T. J. Wilson, Alberta and St. Bart.'s; W. M. Winder, St. Mary's; A. J. Wrigley, St. Thomas's; and E. Zimmerli, St. Mary's.

The undermentioned diplomas were also conferred upon the following candidates:—

Diploma in Ophthalmic Medicine and Surgery.—G. A. Thomas, H. M. Armstrong, B. Basu, W. J. Chapman, J. M. Damany, G. Kumar, S. H. Miles, E. V. Oulton, Freda Ramsay, J. Rego, R. S. Shah, S. S. Sumner, K. N. Tabdon, and H. E. Variava.

Diploma in Tropical Medicine and Hygiene.—E. Benjamin, R. G. Cochrane, T Creaser, P. K. Dixon, W. Dunlop, R. J. Gittins, A. W. Grace, M. L. C. Irvine, R. B. MacGregor, H. G. D. Mathur, Dorothy Mitchell, S. Nag, G. C. Ramsay, Beatrice A. S. Russell, Ruth M. Scutt, H. W. Torrance, and B. B. Yodh.

Diploma in Laryngology and Otology.—Walter R. Beavis, John B. Cavenagh, John Hare, Humphrey I. Marriner, and Thomas G. Wynne.

Diploma in Psychological Medicine.—John S. Harris, William J. T. Kimber, Neil Macleod, Ernest G. T. Poynder, and David Slight.

Diploma in Public Health.—Henry L. Barker, Joyce R. Batten, William G. Booth, Lionel P. Costobadie, Andrew Crawford, Barjor Bamanji Dalal, Edith M. P. Davies, Sidney R. E. Davies, Helen M. Du Buisson, Mary Esslemont, Gwladys Evans, Dorothy J. L. Gallie, Percy C. C. Garnham, George McN. Hargreaves, Marjorie C. Hawkins, Naunton R. Jenkins, Elspeth H. R. Livingstone, Victor A. Luna, Kathleen F. Matthews, Alice D. Pocock, Abraham T. W. Powell, Ivor N. O. Price, Violet Reade, Grace Stevenson, Emma M. Store, Edward Tagoe, Blanchette Thomas, Percy Thwaites, Edgar H. Wilkins, Gwendolen Wilson, and John G. Wilson.

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—W. B. Arnold, St. George's Hosp.; and K. R. Chaudhri, C. E. Donaldson, and R. Hare, St. Mary's Hosp.

Medicine.—H. P. Burns, St. Mary's Hosp.; and J. C. C. Langford and H. Morris (Sect. I.), St. Bart.'s Hosp.

Forensic Medicine.—J. O. W. Bland, St. George's Hosp.; and J. C. C. Langford, St. Bart.'s Hosp.

Midwifery.—H. L. Bernstein and J. L. Hopkins, Guy's Hosp.; G. L. W. Iredale, Edinburgh and St. Mary's Hosp.; and J. de V. Maingard, Guy's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: W. B. Arnold, H. P. Burns, K. R. Chaudhri, C. E. Donaldson, and R. Hare.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination:—

FINAL EXAMINATION.

Amy B. R. A. Perriton, Alexander H. Forman, Montague A. Watson, Edward N. Jamieson, Matthew M. Tannahill, Charles C. Robson, Vellathusseri Chakalakumbil Govinda Menon, Patrick Murray, Harold V. Ritchie-McKinlay, Cyril F. Deutrom, William A. Ekanayake, Samuel B. Jones, Harmanis Amarasinghe, Mary C. Semple, James Donnelly, Oliver H. D. Oliver, Sinnatamby Thambipillai, Archibald Menzies, Robert S. Caldwell, Myer Goldberg, Edward S. Greaves, James H. MacAlpine, Sudhindra Nath Bandyapadhay, James M. Anderson, Simon Levenson, Arthur E. Coyne, James G. O'Keeffe, Darwish Moustafa Safwat, Joseph F. Sweeney, George M. Rose, Daniel T. Gemmell, Charles Campbell, Vernon Bell, Donald M. Gray, David R. Paterson, and Hillel Schulgasser.

Medicine.—Bentis Silva Jayawardena, Fakherddin El-Ahmadi, Nashid Tadros Yusif, Henry A. Newton, Herman H. James, Norman Wren, George H. Tarras, Percy A. M. Jayewardene, Joseph E. Israel, Thomas J. Muir, and Naranapillai Ampalavanar.

Surgery.—Bentis Silva Jayawardena, Mollie F. Churcher, Herman H. James, James Kirkness, George H. Tarras, Arcot Vasudev, Eric S. Brohier, David Stewart, John Ponnambalam Subramamiam, and Naranapillai Ampalavanar.

Midwifery.—Ebenezer A. M. McKinney, Patrick Groarke, Tom G. S. Harkness, Fakherddin El-Ahmadi, John T. Smith, David S. Middleton, Mollie F. Churcher, Norman Wren, Richard F. Pagnam, James M. Rutherford, Joseph E. Israel, Victor B. van Dort, Eric S. Brohier, and David Stewart.

Medical Jurisprudence.—Winifred G. Price, Douglas B. Cruickshank, Carapiet Aviet Basil, Thomas W. Chapman, Frederick Blacklee, Alastair G. Cruikshank, James F. Wallace, Henry B. Martin, George McCracken, William J. Ledgerwood, John B. Hutchison, William W. Crawford, John Lees, Philip Henry, Isaac Michaelson, Eliza Bell, James T. M. Symington, Horace S. Kent, John C. Shiach, Jessie R. Bruce, Alexander F. Chisholm, Ernest G. Douglas, Thomas M. Ormiston, John M. Coutts, George B. Burnett, Catherine Millar, Arthur A. F. Shepherd, Douglas B. Craig, James W. Wylie, Thomas D. Gould, Robert J. Snodgrass, Alexander J. M. Gall, Cassaly Ismail, and John A. Hyde.

University of London.—The following elections have been made at University College, London:—Sharpey Research Scholarship in Physiology: Mr. Richard J. Lythgoe, of the Mercers' School, Trinity College, Cambridge, and University College Hospital Medical School. Percy F. MacGregor Scholarship in Embryology: Mr. G. Payling Wright, of University College School, Hampstead, Exeter College, Oxford, and University College Hospital Medical School.

University of London Unionist Association.—At a meeting of the Association held on July 30th, on the proposal of Sir Philip Magnus, and seconded by Dr. Walter W. Seton, Sir John Rose Bradford, K.C.M.G., C.B., C.B.E., M.D., D.Sc. Lond., F.R.S., was adopted as the official Conservative candidate in the by-election caused by the death of Sir Sydney Russell-Wells, in which polling has been postponed until after the University vacation. Sir John Rose Bradford is a distinguished graduate of the University of London, has been a member of the Senate, and is consulting physician to University College Hospital. In his wider interests as secretary of the Royal Society for seven years prior to the war, consulting physician to the British Expeditionary Force in France, and by numerous scientific works he has earned great esteem. He is opposed to the suggested appointment of a Statutory Commission to carry out the recommendations of the "Haldane Commission," and can be relied upon to safeguard and promote the best interests of the University and its graduates.

Metropolitan Hospital Sunday Fund.—Of the total of £84,000 raised for this Fund by this year's collection, the sum of £83,000 has been distributed to date by the Distribution Committee among 218 London institutions. Awards have been made to 18 London general hospitals, varying in amount from £8110 (London Hospital) to £1170 (Seamen's Hospital), to the total of £47,265, and grants were made to a number of special hospitals, including Queen's (for children), £2000; Hospital for Sick Children, Great Ormond-street, £1780; East London, £1200; Victoria (Chelsea), £1100; National (for paralysis), £1000; Royal London Ophthalmic, £1000; Royal National Orthopædic, £1050; City of London (chest) Victoria Park, £920; Brompton (consumption), £750; and Middlesex (cancer wing), £560. Numerous contributions were made to convalescent homes, cottage hospitals, dispensaries, and nursing associations.

Fellowship of Medicine and Post-Graduate Medical Association.—From August 18th to Sept. 8th there will be a special course in the diagnosis and treatment of common diseases of the nervous system at the West End Hospital for Nervous Diseases. The course will take place at the out-patient department of the hospital situated at 73, Welbeck-street, W. 1, and will consist of lectures, clinical demonstrations on selected cases, &c. During the month of September the following courses will be held: a fortnight's intensive course in medicine, surgery, and the special and other departments at the Westminster Hospital; on dermatology at the Hospital for Diseases of the Skin (Blackfriars); on diseases of infants at the Infants' Hospital; on ophthalmology at the Royal Westminster Ophthalmic Hospital; and on psychological medicine at the Bethlem Royal Hospital. Copies of each syllabus of the August courses, together with the monthly Bulletin, may be had on application to the secretary at 1, Wimpole-street, London, W. 1.

North Devon Children's Convalescent Home, Lynton.—On July 28th this home at Lynton, which has 25 beds and cots for children, was opened by the Earl of Portsmouth. The building, including extension grounds, is the gift of Mr. Robert Living, who has guaranteed a certain sum towards its maintenance. The upkeep is dependent on voluntary contributions, and subscribers have a right to nominate children for a week or so in the home. The home is intended as a general convalescent children's home for non-infectious cases, and special arrangements are being made to deal with surgical tuberculosis.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, August 11th.—11 a.m., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 p.m., Dr. Scott Pinchin: Medical Out-patients.

Tuesday.—11 a.m., Dr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2 p.m., Mr. Sinclair: Surgical Out-patients.

Wednesday.—10 a.m., Dr. Saunders: Medical Diseases of Children. 11 a.m., Medical Registrar: Medical Wards. 2.30 p.m., Mr. Donald Armour: Surgical Wards.

Thursday.—10 a.m., Dr. Grainger Stewart: Neurological Department. 12 noon, Dr. Scott Pinchin: Diseases of the Heart.

Friday.—11 a.m., Mr. Simson: Gynæcological Demonstration. 12 noon, Surgical Registrar: Surgical Pathology. 2 p.m., Dr. Burrell: Medical Out-patients.

Saturday.—9.30 a.m., Dr. Burnford: Bacterial Therapy Department. 10 a.m., Dr. Saunders: Medical Diseases of Children. 10 a.m., Mr. Banks Davis: Operations of the Throat, Nose, and Ear.

Daily 10 a.m. to 6 p.m., Saturday 10 a.m. to 1 p.m., In-patients, Out-patients, Operations, Special Departments.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.

Monday, August 11th, to Saturday, August 16th.—Hospital for Consumption and Diseases of the Chest, Brompton. Mon., 10 a.m., Dr. Burrell: Artificial Pneumothorax and Fluid Replacement. 12 noon, Dr. Inman: Immunity in Relation to Diagnosis and Treatment in Pulmonary Tuberculosis. 2 p.m., Dr. Melville: Dem. in X Ray Department. Tues., 10 a.m., Dr. Punch: The Complement-Fixation Test in Pulmonary Tuberculosis. 12 noon, Dr. Davidson: Dem. of Non-Tuberculous Cases. 2 p.m., Sir James Dundas-Grant: Throat Cases. Wed., 10.30 a.m., Mr. Tudor Edwards: Operations. 2 p.m., Dr. Wall: Dem. in Wards. 3 p.m., Dr. Gosse: The Electrocardiograph and its Uses. Thurs., 10 a.m., Dr. Burrell: Vital Capacity in Diseases of the Chest. 12 noon, Dr. Beaumont: Dem. of Advanced Cases. Fri., 10 a.m., Dr. Davidson: Artificial Pneumothorax. 2 p.m., Mr. Roberts: Operations. Sat., Dr. Batty Shaw: Demonstration of Cases.—Queen's Hospital for Children, Hackney-road. Mon., 10 a.m., Mr. Broster: Cases Illustrating General Surgery. 5 p.m., Dr. Hewer: Anæsthesia in Children. Tues., 10 a.m., Mr. Todd: Lecture-Demonstration—Cases Illustrating Treatment of Injuries to the Elbow. 2 p.m., Dr. King: Medical Cases. Wed., 10 a.m., Mr. Todd: Lecture-Dem. Common Fractures in Children. Thurs., Dr. Winnicott: Medical Cases. 2 p.m., Mr. Whitchurch Howell: Demonstration of Surgical Cases, chiefly Orthopædic. Fri., 10 a.m., Mr. Broster: Cases Illustrating General Surgery. 4 p.m., Mr. Whitchurch Howell: Lecture-Dem.: The Importance of Detail in Orthopædic Surgery. Sat., 10 a.m., Mr. Whitchurch Howell: Operations and Demonstrations.

Appointments.

Edwards, Miss K. St.V., M.B., B.S. Lond., has been appointed Medical Officer of the Surgical Department, Glanely Sanatorium, S. Wales.

Higson, W. D., M.B., Ch.B. Liverp., Medical Officer of Maidstone Gaol.

Lawrence, R. D., M.D. Aberd., Chemical Pathologist and Lecturer in Chemical Pathology, King's College Hospital.

MacCallan, A. F., C.B.E., M.D., Camb., F.R.C.S. Eng., late Director of Ophthalmic Hospitals in Egypt, to be a Consulting Ophthalmic Surgeon to the Cassel Hospital for Functional Nervous Disorders.

Shepherd, W. M., M.D. Edin., F.R.C.S. Edin., to be an additional Medical Referee under the Workmen's Compensation Act for the Districts of the Doncaster and East Retford County Courts.

Hampstead General and North-West London Hospital: Gray, A. O., F.R.C.S. Eng., M.R.C.P. Lond., Gynæcologist; Hodgson, H. G., M.B., B.S. Durh., D.M.R.E. Camb., Radiologist; Stobo, A., M.B., Ch.M. Sydney, House Physician; Dick, B. M., M.B., Ch.B. Edin., House Surgeon; Bradley, R., M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S. Eng., Casualty Medical Officer; Hayward, M. F., M.B., B.S. Lond., Casualty Surgical Officer.

Manchester Royal Infirmary: Brockbank, W., M.R.C.S., L.R.C.P., Resident Medical Officer, Barnes Convalescent Hospital, Cheadle: Galloway, R. L., M.B., Ch.B. Edin., Senior Surgical Registrar; Scotson, F. H., F.R.C.S., Second Surgical Registrar.

Certifying Surgeons under the Factory and Workshop Acts: Armstrong, C. W., L.R.C.P. Lond., M.R.C.S. (Castleton); Emmett, R. H., L.R.C.P. Lond., M.R.C.S. (Portsmouth).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary and Children's Hospital.—Hon. M.O.
Barnstaple, North Devon Infirmary.—H.S. £150.
Birkenhead Education Committee.—Asst. M.O. £600
Blackpool, Victoria Hospital.—Asst. H.S.
Brighton, New Sussex Hospital.—H.S. £50.
Brighton, Royal Sussex County Hospital.—H.S. £150.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
City of London Hospital for Diseases of the Heart, Victoria Park, E.C.—Half-time M.O. £200.
East Ham County Borough.—Asst. M.O. £600.
Gloucestershire Royal Infirmary, Gloucester.—Asst. P. and Pathologist.
Greek Refugees, Macedonia.—M.O. £350.
Hertfordshire County Council.—School Dentist. £500.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—H.P. £100.
Kent Education Committee.—School Dentist. £504 14s.
Leeds Township Infirmary.—Asst. M.O. £275.
Leicester Royal Infirmary.—Second Res. Anæs. £200.
Melbourne University, Victoria, Australia.—Chair of Pathology. £1200.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. M.O. £250.
Otago University, New Zealand.—Prof. of Surgery. £600.
Pontypridd Union, Llwynypia Hospital.—Sup. M.O. £700.
Royal Devon and Exeter Hospital.—Asst. P.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.
Sherwood Forest, Notts, Ransom Sanatorium.—Asst. R.M.O. £375.
Shrewsbury, Royal Salop Infirmary.—H.P. £160.
Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
Staffordshire Education Committee.—Asst. Sch. Med. Insp. £600.
Stockport Infirmary.—Third Res. H.S. £175.
Tunbridge Wells General Hospital.—H.S. £160.
West Ham County Borough.—M.O.H. and Chief Sch. M.O. £1500.
Whittingham, Preston, Lancs, County Mental Hospital.—Locum Tenens M.O. £8 8s. per week.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Uckfield, Sussex.

The Secretary of State for the Home Department gives notice that he proposes to appoint another Surgeon as an additional Medical Referee under the Workmen's Compensation Act, 1906, for the districts of the Gateshead, Hexham, and Bellingham, Morpeth and Blyth, Newcastle-upon-Tyne, North Shields, and South Shields and Jarrow County Courts (Circuit No. 1). Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than August 23rd, 1924.

The Secretary of State for the Home Department gives notice that in consequence of the death of Mr. A. Benthall, one of the Medical Referees under the Workmen's Compensation Act, 1906, a fresh appointment or appointments have to be made in respect of the districts of the following County Courts: Uxbridge (Circuit No. 34); Croydon and Epsom (Circuit No. 45); and Brentford (Circuit No. 46). Applications should be addressed to the Private Secretary, Home Office, and should reach him not later than August 23rd, 1924.

Births, Marriages, and Deaths.

BIRTHS.

HICKINBOTHAM.—On July 26th, at Colchester, the wife of J. R. Hickinbotham, M.B., of a son.

PANTON.—On July 30th, at Solihull, Warwickshire, the wife of Major H. F. Panton, R.A.M.C., of a daughter.

MARRIAGES.

ROWELL—SCOTT.—On July 30th, at St. Mary's, Nether Alderley, Major W. H. Rowell, O.B.E., M.D. (late R.A.M.C.), to Sarah, elder daughter of Edward Scott, Esq., Rookwood, Alderley Edge.

DEATHS.

COOPER.—On July 30th, at a nursing home, Ernest Frederic Cooper, M.R.C.S., L.R.C.P.

VEALE.—On July 30th, in London, Major Philip John Veale, M.D., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL GWENT HOSPITAL, NEWPORT, MON.—On August 4th a new wing of the hospital was opened by Lord Tredegar. The wing was erected at a cost of £80,000, and is part of an extension scheme which will cost £240,000, to which £13,000 have already been contributed by colliery and other workmen.

Notes, Comments, and Abstracts.

HOW TO POPULARISE CREMATION.

ALTHOUGH the disposal of the dead by cremation has developed in England during the last fifty years to such an extent that it has now become almost an every-day occurrence, the fact remains that it has obtained no marked preference amongst the larger proportion of the people. Fifty years ago the Cremation Society was formed in the interests and for the welfare of the living, to promote a movement towards a more sanitary and economic and æsthetic method of disposal of the dead than is effected by earth burial, and on August 1st the third annual conference of cremation authorities was held at the Conference Hall of the British Empire Exhibition at Wembley. Sir Thomas Horder, who occupied the chair at the invitation of the Rt. Rev. Bishop Charles Gore, said that the problem which remained to be solved was to find the means of popularising cremation, as at present it was too much confined only to the more thoughtful and more imaginative members of the community. Our cemeteries, he said, increasing yearly in number and size, hem in the urban dwellers and disfigure the landscape, and as yet neither our civilisation nor our culture have found an equally satisfactory and popular solution of the difficulty. Propaganda might take place along three lines. In the first place, from the sanitary aspect, the advantages of cremation were obvious enough to all thinking medical men and even laymen, but such an argument would hardly stir the popular imagination, as the progress of any reform which touched a traditional sentiment must always be slow. In the second place, an appeal on the ground of economy might be more successful, but was more likely to influence local authorities than the general public. In the third place, he said, the strongest appeal might be made from the sentimental and æsthetic point of view, and, to do this, it was necessary to demonstrate that cremation could be invested and surrounded by religious and sentimental ideas which were quite as deep and inspiring as those which attended the ceremony of earth burial. Bishop Gore dealt with the prejudice against cremation that was felt by a great many people and arose from the conception that there was a resurrection of the dead by the re-collection of the material atoms and elements of the dead body at the end of the world. What he was glad to tell people haunted by that sort of theological scruple was that even in the earlier days of Christianity there were people like St. Paul, who stoutly maintained that it was an impossible and unintelligent conception. In the Nicene creed instead of "I believe in the resurrection of the *flesh*" or "the resurrection of the *body*," the phrase was "the resurrection of the *dead*." Such scruple, therefore, was no part of the Christian creed, and in any case it had no bearing on the question of cremation as opposed to burial, because cremation only did more rapidly what in any case ultimately occurred. While the Roman Catholic Church still prohibited cremation, it did not do so on theological grounds but out of deference for past custom. If, he concluded, the practical advantages of cremation were properly considered, within a measurable time this method might be widely applied to the national advantage.

PUBLIC HEALTH IN MAURITIUS.*

THE estimated population of Mauritius on Dec. 31st, 1921, was 376,314, and 377,594 on the corresponding date in 1922. The birth-rate in 1922 was 37·0 per 1000, as compared with an average of 36·2 for the quinquennium, 1918-22. In the several districts the ratio varied from 26·6 in Black River to 43·4 in Moka. The death-rate was 34·5, a distinct improvement on the quinquennial average of 42·0 per 1000. The district variations ranged from 23·8 in Plaines Wilhems to 40·8 in Grand Port and 42·6 in Port Louis. (These are crude rates, including deaths of persons arriving from other districts.) The *infantile mortality* was 147·9 per 1000 births, as compared with 179·7 in the previous year. The chief cause was "congenital debility." Dr. T. B. Gilchrist, Director of the Medical and Health Department of the colony, who presents the report, states that unfortunately registration of stillbirths is not compulsory, and the total number probably greatly exceeds the number registered (1678). Venereal disease and congenital causes accounted for the majority. Owing to early marriages amongst Indians, and bearing of children at an immature age, as well as hardships and privations among the lower classes, many children are born in a weak state. Twenty midwives have been trained and placed on the sugar estates, but no township except Port Louis possesses a qualified midwife, which is "a deplorable state of affairs." A Midwifery and Child

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* Report on the Medical and Health Department, 1922. Port Louis.

Welfare Society was started, but "unfortunately the ladies got disheartened from want of financial support, and the society is at present dormant."

Hospitals and Dispensaries.

At the various hospitals and dispensaries 111,466 cases of illness were treated during the year under review, a considerable advance on the quinquennial average of 96,808. The admissions to hospital for *malaria*, including those for enlarged spleen, numbered 2762, and in addition 30,897 cases were treated in the various public dispensaries. A spleen census was carried out among 14,659 school-children, in 15·8 per cent. of whom enlargement was detected. No examination was carried out in the districts of Grand Port, Savanne, Black River, or Plaines Wilhems; in the other five districts the percentage of enlargement varied from 4·6 in Moka to 20·8 in Port Louis and 21·3 in Flacq. The bionomics of *Anopheles costalis* were investigated by Mr. Malcolm MacGregor during eight months of the year under report[1]. It was found that *A. costalis*, *A. maculipennis*, and *A. funestus* were present, the first named being the chief agent for the spread of malaria in the island. Breeding places were found up to 1200 ft. *A. maculipennis* occurs extensively in Port Louis and along the coastal belt below 500 ft. altitude. *A. funestus* was found up to 500 ft. A large amount of antimalarial work was carried out in the construction of drains, destruction of mosquito-breeding places, clearance of marshes, &c. There were 224 notifications of *enteric fever*, of which 106 were in Port Louis. Of the total cases 158 were notified in the six months, February to July; and of those in Port Louis 98 in this period. Dr. Gilchrist states that the difficulties experienced by his department "have been accentuated by the fact that medical practitioners in many cases do not notify the disease until the patient has either recovered or died, and then only for purposes of having the premises disinfected. . . . Such late notification and existing conditions prevent the Medical and Health Department from combating the disease in a prompt manner." Such remissness is inexcusable, and indeed inexplicable. Absence of proper latrine accommodation, pollution of the Grand River water-supply, and prevalence of flies are the chief factors in the enteric incidence.

Leprosy, Plague, &c.

With regard to *leprosy*, this disease is not classified in Mauritius as infectious, and therefore is not notifiable; lepers are not segregated. Dr. Gilchrist, however, states "That leprosy is a contagious disease is certain, and I strongly urge that leprosy be made notifiable." The Powder Mill Leper Hospital is now completed, and "every inducement should be made to get all pauper lepers who are receiving Government relief to enter that institution, and if necessary, to compel them to do so, and supervision of contact of well-known lepers should be provided for." No allusion is made to the fish-diet theory of causation, or to the probability of transmission by bites of insects.

Plague is endemic in Mauritius. In 1899 there were 919 cases, and in 1903, 978 cases. During 1922 the cases reported numbered 98, as compared with 375 in the previous year. Of these 98 cases, 65 occurred in Port Louis and 26 in Plaines Wilhems district; 75 were fatal. From February to August no plague was reported, except 3 cases in Plaines Wilhems (February), and 3 in Port Louis (August); no plague bacilli were found in rats from Feb. 13th to July 30th. Iodine given intravenously was found to be the most successful treatment; the dose is not stated. The mortality from *pulmonary tuberculosis* was 1076, and for all forms of tuberculosis 1083, as compared with 1027 and 1071, the quinquennial averages. There has been no *small-pox* in the island since 1913; 10,140 children were vaccinated, being 76·60 per cent. of the total births. "The danger of an unvaccinated population is not realised until an epidemic of small-pox occurs."

The Cleansing Campaign.

Dr. J. Balfour Kirk, M.O.H. for Port Louis, arrived in the colony in September, 1922, and refers to the cleansing campaign carried out by Dr. Gilchrist, "which was a complete success, and for the first time in their lives the inhabitants were able to see in their own streets and yards a condition which would be a credit to any city in the world." The disposal of nightsoil is, however, "uniformly unsatisfactory." The water-supply from Grand River and the Bathurst and Dayot canals is also bad, and improvement in this direction is the most urgent sanitary reform required. "The housing problem in Port Louis is acute." Improvements are, however, being made, and when the new buildings are completed the slum property will be closed for human habitation. With regard to food-supply the position is most unsatisfactory. "Legal power to control the quality of food and drugs is practically non-existent. . . The milk trade in Port Louis is in as corrupt a state as it is possible to be in." Of 276 samples examined 52 per cent. were sophisticated; also 79,656 lb. of fish, 13,320 lb. of flour, and 2430 lb. of margarine were seized and disposed of by dumping.

School medical inspection was started in Port Louis during the year, ten schools being visited, and the number of children examined being 1189. The chief diseases notified were ankylostomiasis (439), malaria (237) and bad teeth (148). Dr. Keisler notes that the water-supply is defective; it is obtained either from the Grand River Northwest reservoir or the Bathurst Canal. These waters are far from pure, and no filters are used. The accommodation is inadequate in the great majority of schools, and the desks and seats "of the ancient type, tending to malformation of the spine and chest, and their arrangement as regards light is in many instances defective."

"THERMAL ANAPHYLAXIS."

WE have received from Dr. Henri Médawar, of Vichy, a little pamphlet in which he describes the treatment of a series of persons, who were intolerant of one of the Vichy waters, by means of daily subcutaneous doses of the same water. He believes that individuals of an arthritic diathesis, to whom this water is obnoxious, when so treated may acquire tolerance of large and adequate doses. Such observations, if supported, appear to favour the hypothesis that the well-known disturbances which medicinal waters (in themselves colloidal suspensions) set up in sensitive subjects may be due really to slight forms of colloidal shock. Minute doses of the same water would appear to effect the desensitisation of these subjects.

THE PREVENTION OF FIRE.

Dr. F. J. Waldo, coroner for the City of London, has issued, under the direction of the County Purposes Committee of the Corporation of the City of London, a set of instructions as to what to do in the case of fire, together with points for the prevention of fire.

The connexion between the office of coroner and the prevention of fires may seem somewhat remote, but under the City of London Fire Inquests Act of 1888, which is unique in its scope in Great Britain, it is the duty of the coroner for the City to conduct judicial inquiry into the cause and all the circumstances (including construction and means of escape from fire) of non-fatal as well as fatal fires. The City coroner has power to send persons on his inquisition for trial for arson or incendiarism. From 23 years' experience of fires gained in this way Dr. Waldo has drawn up his suggestions, which are printed in the form of fire cards, to be distributed among offices, workshops, and other buildings in the 26 wards of the City. Larger poster-notices are to be exhibited in public buildings and schools. Dr. Waldo says that the public generally are intensely ignorant about all matters connected with fires, and that the education of the rising generation is the best fire insurance against unnecessary loss of life and property. He finds, for instance, that few citizens (save police constables) know the whereabouts of the nearest street fire-alarm to their premises. Not uncommonly, again, on the breaking out of a fire, persons on using the 'phone merely say—Fire! and, without waiting to give their address, replace the receiver and await the arrival of the fire brigade, which, of course, never comes. Further, he emphasises the extreme importance of calling the brigade at once in all cases of fire. Copies of the fire cards and posters can be obtained from the town clerk, Guildhall, London, E.C.

A SELF-ACTING SYRINGE.

AT the thirty-sixth Congress of the German Society for Internal Medicine, held recently in Bad Kissengen, there was exhibited a new syringe for injection and aspiration invented by Felix Myer, of Aix-les-Bains. The syringe is made of glass, and is sold ready filled with an accurately measured quantity of the required drug, the needle being welded on to the body. After use the instrument can be thrown away. The motive power is supplied by a carefully regulated amount of sterilised compressed air which can be released by a simple movement. For aspiration purposes the same principle is employed, only in this case a sterile vacuum takes the place of the drug and the compressed air. This type can also be used for venepuncture. The advantage lies in obviating frequent and repeated sterilisation of the syringe and in each case a new and sharp needle is employed. A point about the syringe is that when making intravenous injections or in withdrawing blood from a vein a small capillary tube inside the syringe allows the operator to see whether the vein has been correctly pierced before the syringe is put into action.

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[1] A detailed review of Mr. MacGregor's study of anophelines in Mauritius appeared in THE LANCET of June 14th, p. 1228.

Oliver-Sharpey Lectures.

Delivered before the Royal College of Physicians of London

BY A. V. HILL, Sc.D., F.R.S.,
PROFESSOR OF PHYSIOLOGY, UNIVERSITY COLLEGE, LONDON.

LECTURE I.—THE RECOVERY PROCESS IN ISOLATED MUSCLE.

THE CONSISTENCY OF NATURE.

FORTUNATELY for physiology and medicine many human functions are sufficiently akin to those of animals to make it possible to apply the results obtained by studying one reciprocally to the other. Recent advances in medicine make it indeed unnecessary to emphasise this fact. Fortunately too many organs, especially in the lower animals, can be made to function apart from the body; we may, so to speak, isolate our variables and examine them one at a time. It is probable that a great field of research lies in the future before a study which is still quite young, that of tissue cultures. Fortunately, too, nature is consistent—though to believe that this is so requires on occasions a certain amount of scientific faith. It is a great reward to that faith when examples of this consistency appear, as indeed they do in the subject on which I am to have the privilege of speaking to you.

ACADEMIC PHYSIOLOGY.

The study of muscle and nerve was for long one of the chief activities of many of the finest intellects in physiology. I need mention only a few, the names of Burdon-Sanderson and Gotch, of Helmholtz, Fick, and Blix, of Keith Lucas, Gaskell, and Mines. The strongest motive—indeed, the only good motive—for investigating a "useless" and academic subject is the same as led Pasteur to study optical activity, or the physicists of the last century to study the conduction of electricity through gases—viz., an interest in the phenomena for their own sake. One knows now the practical importance of Pasteur's work, X rays and wireless telegraphy are a sufficient practical illustration of the value of physics. It would, indeed, be unnecessary here to advocate, to make an apology for, these academic studies, were what is said here not sometimes heard outside. The fact that you have done me the honour of inviting me to give these lectures is a sign that you, at any rate, do not regard the apparently useless as not to be encouraged. The best motive, because the most effective, in investigation and research, is simply the desire for knowledge, not merely the pursuit of power or money, or even the improvement of the amenities of human life. The desire to prevent suffering, noble in itself as it is, would never of itself have led to the discovery of X rays, nor will it lead to the elimination of diseases produced by filter-passing organisms or of the scourge of cancer. One's head, indeed, must be tempered by one's heart, but one's head is still the organ by which intelligent progress is made.

In physiology, however, the young people whom one has to teach are often so severely practical; they have escaped from the "useless" learning of school, they have "put away childish things," and if one wants to tell them about the refractory period of nerve or the recovery process in muscle, they say—sometimes openly to oneself, almost invariably to one another—"What is the use of that? What application can this have in the wards?" and they go off probably—small blame to *them*—to someone else, who will cram them better for their examinations so that they may get on the quicker with something useful.

An opposition, however, is not a bad thing, as Parliamentary Government shows. No dictatorship, least of all in science, is good, either for the dictator or for those to whom he dictates. It is an excellent thing for our students to be free to ask us, "What is the use of this, or that?" and to have us reply that it is no use—at any rate, at present—that we do not tell them things because they are useful, but because they are interesting. It is a great stimulus to us to have to find applications, in living man, of the facts discovered on portions of frog or cat; indeed, the greater part of the information which I hope to discuss with you in my second lecture was acquired directly under that kind of stimulus. One told one's students about lactic acid and the recovery process in isolated muscle; the presence in the laboratory at Manchester of my colleague, Dr. F. W. J. A. Lamb, with a special sub-department of human physiology, together with the ever-present, if unexpressed, desire of one's students to hear about man rather than about the frog, led one to see how application could be made. My colleagues, Lupton and Long, aided by the Medical Research Council, have made many of the applications which I hope to describe in my second lecture.

Mutual Dependence of the Theoretical and Practical.

To every action there is an equal and opposite reaction. Often, after the first step has been made on the academic side and applied on the practical side, the latter reacts on the former by suggesting further problems, by providing a new or a better technique. One can see it in physics; physical progress depends largely on instruments and technique. Technology requires, with a certain latent period, the new advance on the theoretical and academic side. To take a personal example, I have recently been privileged to collaborate with my friend Prof. Gasser, of St. Louis, in an extraordinarily interesting development of a very old subject, one that we, like many other people, had thought moribund, the mechanics of muscular contraction. This work arose directly from, and I think might never have arisen without, a series of experiments made three years ago on the relation between speed and efficiency in human muscular movement, a subject of practical, even of industrial, importance. Those experiments, in their turn, had arisen from a study of the thermodynamics and the absolute efficiency of muscular movement in the frog. To take another example. Experiments on the electric change in isolated tissues led to the study of the human electrocardiogram; the phenomena of fibrillation and flutter in man led to the further study of circus movement in the exposed mammalian heart and of the changes of refractory period associated therewith. This in its turn will lead to further knowledge of human cardiac disorders. To take a third example. The importance of human diabetes has long stressed the interest of pancreatic function in animals; that has led to the discovery of insulin, a subject not only of great practical importance, but of very considerable scientific interest in relation to metabolism, oxidation, and, ultimately, to the mechanism of muscle. We academic physiologists must not be ungrateful to our students and our practical medical friends—our Parliamentary opposition—if they stimulate us to widen our views and prove the practical application of our studies; for the needs and problems of those applications will, and must, react in the end to our good.

Let me now, after this attempt at an apology, turn to my thesis.

MUSCULAR FATIGUE.

The isolated muscle stimulated in air, or in Ringer's solution saturated with air, with more than a certain frequency, rapidly fatigues; stimulated with a lower frequency, it lasts a longer time; stimulated infrequently it may remain alive for several weeks. If maintained in Ringer's solution saturated with oxygen, it may be stimulated every ten seconds for several days; with very frequent stimulation it is completely exhausted in a few hundred twitches. Left without oxygen, it never recovers from this fatigue; in a few hours it goes into rigor and dies. Left in oxygen, however, it completely recovers, its contracture disappears, and it is ready to function again as well as ever. Moreover, in oxygen it will rapidly reach a steady state (Fig. 1) in which breakdown in activity is balanced exactly by restoration in recovery. This steady state in oxygen, which was first clearly pointed out by Fletcher, is of peculiar importance when we come to study prolonged human muscular activity.

LACTIC ACID.

Such observations on the isolated muscle led to a study of lactic acid—its accumulation in activity, its removal in recovery. Fletcher and Hopkins's experiments, published in 1907, are now the basis of all muscle physiology. In a muscle left at rest in oxygen the lactic acid concentration never increases and may decrease; in a muscle left in air, it increases slowly; more rapidly, however, in inert gases such as hydrogen or nitrogen. If a muscle be subjected to some harmful influence, such as mechanical injury, coal-gas, alcohol, or chloroform, its lactic acid content increases rapidly. This anaerobic production of lactic acid is increased by a rise of temperature, an effect which culminates in an almost explosive production of lactic acid during heat rigor, which occurs, in such an animal as the frog, at about 35·5° C. When a muscle is initially fatigued and then left in oxygen, its lactic acid concentration continually falls over a period of hours—that is, the recovery process—and the muscle becomes as capable as before of reacting to a stimulus. In such a case—regarded from the standpoint of the intact animal—the oxygen supply is grossly inadequate, owing to the slowness of its diffusion through the muscle substance from outside. The recovery process, in the presence of an adequate supply of oxygen, as in man after moderate exercise, or in the isolated muscle after a single twitch, is far more rapid. This abolition of lactic acid during the recovery process does not appear to diminish the total amount of it which can be obtained later from the same muscle by stimulation, by mechanical injury, or by heat rigor; either it is not oxidised but rather restored to some previous position in the chemical architecture of the muscle, or there is some limit to the lactic acid concentration set by its own presence there, for example, by the rise in hydrogen-ion concentration which it causes. We shall see later that both explanations are essentially true.

These experiments of Fletcher and Hopkins, which have been fully and widely confirmed since by Meyerhof and others, were obviously of fundamental importance in the study of muscle. They were the starting-point of the investigation which Prof. Langley proposed to me in 1909, as they were the basis of Meyerhof's recent work. They clearly opened up all kinds of problems—what happened to the lactic acid when it was removed in recovery? How long did the process take when the oxygen supply was adequate? Was the lactic acid the essential link in the chain of muscular contraction, or only a by-product to be got rid of as soon as possible? Many of these questions have since been answered, largely by the aid of experiments on the heat production of muscles under various circumstances.

HEAT PRODUCTION OF MUSCLES.

There is a special advantage in studying the heat production of muscles; this will be obvious to any who, in these mechanical days, like to regard the muscle as a machine. The first and most important factor in a machine is the amount of energy which it uses. A much more important advantage, however, in studying muscle is the fact that *heat* measurements can be made without injuring the tissue, continuously while the processes inside it are going on. To study the *chemical* changes in a muscle requires us to destroy it each time we make an observation. The sensitivity, moreover, of the thermo-electric method, applied to measurements of heat in muscle, is so great that it is possible to examine, during and after a single twitch, the processes which can be studied by chemical methods only after severe activity.

RIGOR MORTIS.

We have learnt a great deal in this connexion from the study of rigor mortis. When a frog's muscle is warmed to 35° C. or more it goes rapidly into rigor, the only chemical process known to accompany this condition being the production of lactic acid—as Fletcher and Hopkins showed—followed by the effect of the acid in producing stiffness or coagulation of the muscle substance. The heat liberated during rigor is one to two calories per gramme of muscle. Seeing that no chemical processes are known to accompany rigor except the lactic acid production, it was natural to attribute this liberation of heat to the unknown process by which the lactic acid also is liberated. This rigor heat is considerably reduced by previous injury, by prolonged anaerobic survival, or by stimulation. The same heat may be liberated in rigor produced by chloroform; it also is reduced by survival without oxygen and by fatigue. Its level is restored by oxygen after fatigue, and maintained at a high level during resting survival in the presence of oxygen. The heat liberated per gramme of lactic acid was estimated roughly in 1912 as being about 370 calories. Recent and much more accurate measurements by Meyerhof have confirmed this value. Peters, in 1913, found that the heat liberated during stimulation to complete fatigue is about 0·9 calories per gramme. The heat liberated in subsequent rigor is about 0·87 calories. Rigor in the unstimulated muscle gave about 1·7 calories. Stimulation of fresh muscles leads to the liberation of about 0·2 per cent. lactic acid; rigor to one of about 0·4 per cent.; stimulation followed by rigor also to about 0·4 per cent. Hence it is obvious that lactic acid and heat formation run parallel to one another, and that rigor and anaerobic activity involve the same chemical change—namely, the production of lactic acid from some precursor with the liberation of about 370 calories for every gramme of acid set free.

ORIGIN OF LACTIC ACID.

This determination of the heat production associated with the formation of 1 g. of lactic acid, either in rigor or in the anaerobic activity of muscle, enables us to decide with fair certainty what are the chemical reactions associated with contraction, and from what substance the lactic acid arises. Now, it is probable on other grounds that glycogen is the precursor of lactic acid. The heat of combustion of dissolved glycogen $(C_6H_{12}O_6)n$ has been determined by Slater as 3836 calories, that of lactic acid $(C_3H_6O_3)$ by Meyerhof as 3601 calories per gramme; the formation, therefore, of lactic acid from glycogen is accompanied by the liberation of 235 calories per gramme. Now, as we shall see shortly, this lactic acid never occurs as such to any appreciable degree inside a muscle; it is always there neutralised in the form of sodium or potassium lactate. There are grounds for believing that the neutralisation takes place at the expense of a sodium protein salt, the alkali protein substance of the muscle itself. According to Meyerhof the heat of this neutralisation is 135 calories, so that the total heat associated with the formation of lactic acid from glycogen and its subsequent neutralisation would be 370 calories. This is precisely the amount of heat set free when 1 g. of lactic acid is formed inside a muscle during activity or rigor. It is obvious, therefore, that in the initial process of contraction and relaxation—i.e., apart from recovery—no chemical change of any importance occurs except the formation of lactic acid at the expense of glycogen and its subsequent neutralisation. There may be small, and from the energy standpoint unimportant, side reactions, but it is a great simplification to know that the fundamental chemical process underlying a contraction is simply the formation of *lactic acid from glycogen.*

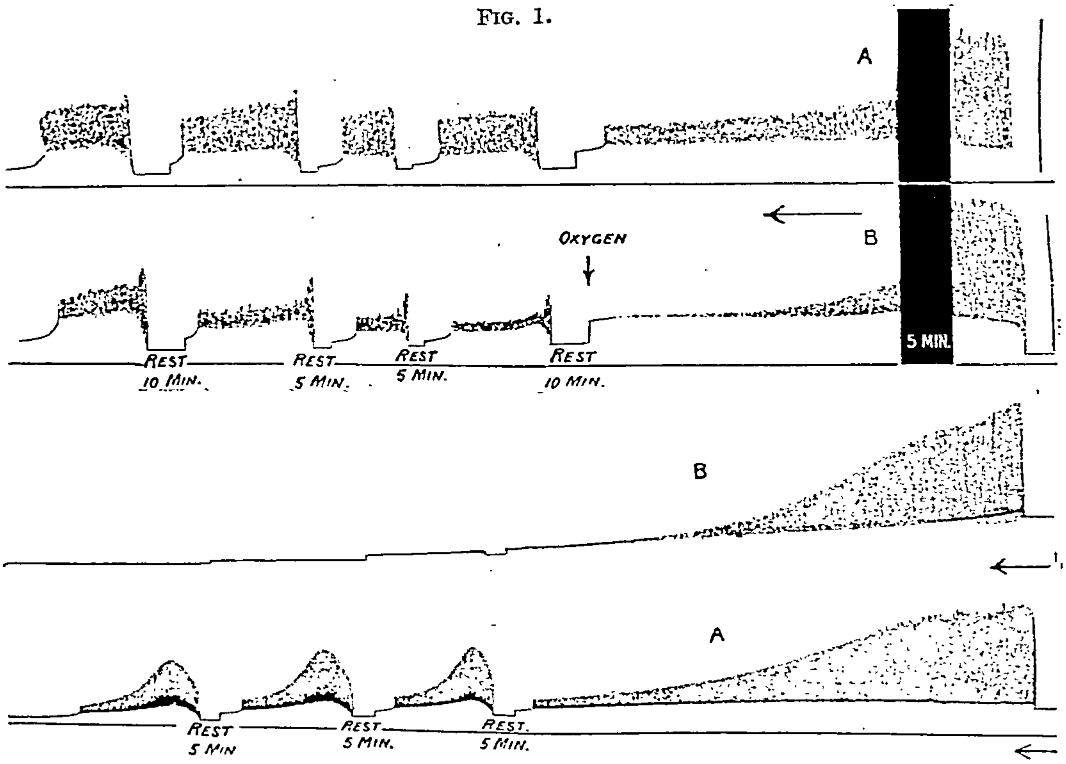
That glycogen is, indeed, the precursor of lactic acid in the muscle is shown by the direct determinations of Meyerhof, which have been confirmed in Hopkins's laboratory. During anaerobic activity, or survival, glycogen disappears from the muscle and lactic acid appears in exactly equivalent amount; CO_2 is driven out by the lactic acid from the bicarbonate present in the muscle; heat is liberated proportional to the lactic acid. No change, however, is observed in the fat, and the lactic acid maxima are, in exercise 0·25 to 0·4 per cent., in rigor 0·4 to

0·7 per cent. The reaction is apparently a self-inhibited one; it is stopped by the rise of hydrogen-ion concentration produced by the lactic acid and may be caused to go further by the presence around the muscle of alkali and phosphates. Presumably the complete failure to contract, produced by muscular fatigue, is due to the same cause.

BUFFERS IN MUSCLE.

The accommodation in the muscle of these enormous quantities of lactic acid requires some special consideration. It has been stated that during activity a muscle becomes acid; so it does, but only very slightly. Were the acid free inside it the hydrogen-ion concentration would rise thousands of times as the result of a few contractions. Ritchie in 1922 showed, by an electro-metric method, that no appreciable change in the hydrogen-ion concentration of a muscle occurs after several seconds tetanus; the acid, therefore, is neutralised. In blood we know that there are various alkaline buffers—bicarbonate, phosphate, and particularly the sodium or potassium salt of hæmoglobin. These react with an added acid, forming a neutral salt and the undissolved buffer acid. So it is in muscle. The total amount, however, of bicarbonate and phosphate is insufficient to neutralise all the acid formed in exercise, and it has been shown by Meyerhof that the main part of the neutralisation occurs as the result of combination of the acid with the sodium protein salt of the muscle tissue itself. The amount and efficiency of this buffer constituent of the muscle are the chief factors enabling the muscle to stand high concentrations of acid—that is, to tolerate a high degree of activity.

FIG. 1.



The upper two tracings show fatigue of pair of gastrocnemii, (A) in oxygen, (B) initially in nitrogen 19° C. Max. break shocks every second. Note "steady state." The lower two show fatigue of pair of sartorii, (A) in oxygen, (F) in nitrogen. (Fletcher, 1902.)

MYOTHERMIC EXPERIMENTS.

I will pass on now to describe the experiments made by means of the thermo-electric method on the isolated muscle, which have enabled us to describe the time course of the events which happen during and after muscular activity. The thermo-electric method is a highly sensitive one; it is possible—if one desires—to obtain deflections of more than a kilometre for one degree centigrade! Such a sensitivity indeed is not wanted, since the rise of temperature in a muscle twitch is of the order of 3/1000th of a degree; it is necessary merely to read to the nearest 100,000th of a degree to obtain all the sensitivity required for such observations. It is essential to keep the muscle in its chamber far removed from any external temperature disturbances; this is done by sinking it under water maintained at a constant temperature in a large double-walled vacuum flask. Connected to a sensitive galvanometer the thermopile registers its changes of temperature on a revolving drum carrying photographic paper. When the muscle is stimulated its temperature rises and the galvanometer deflects, the moment of stimulus being recorded on the record. The deflection reaches a maximum comparatively slowly, owing to lag in conduction of heat into the thermopile and inertia of the galvanometer system. It then moves slowly back towards its original zero, owing to gradual equalisation of temperature along the thermopile and loss of heat by conduction to outside. The curves by themselves do not tell us much about the time course, or the absolute magnitude, of the liberation of heat; it is necessary to make a "control" experiment. A known amount of electrical energy, carefully measured, is liberated inside the same muscle after it is dead, in the same position on the thermopile, and the resulting rise of temperature is registered. The comparison of the maximum in the control heating, with the maximum when the muscle produces its rise of temperature by its own physiological activity, gives us in absolute units the heat production in the latter case. The comparison of the forms of the curves enables us, by a somewhat laborious numerical technique, to analyse the production of heat in the live muscle, as a function of the time. I say laborious: may I take this opportunity of emphasising how the results which I am just describing are mainly due to the skill and patience of my colleague, W. Hartree. Without him it would never have first clearly pointed out by Fletcher, is of peculiar importance when we come to study prolonged human muscular activity.

LACTIC ACID.

Such observations on the isolated muscle led to a study of lactic acid—its accumulation in activity, its removal in recovery. Fletcher and Hopkins's experiments, published in 1907, are now the basis of all muscle physiology. In a muscle left at rest in oxygen the lactic acid concentration never increases and may decrease; in a muscle left in air, it increases slowly; more rapidly, however, *in inert gases such as* hydrogen or nitrogen. If a muscle be subjected to some harmful influence, such as mechanical injury, coal-gas, alcohol, or chloroform, its lactic acid content increases rapidly. This anaerobic production of lactic acid is increased by a rise of temperature, an effect which culminates in an almost explosive production of lactic acid during heat rigor, which occurs, in such an animal as the frog, at about 35·5° C. When a muscle is initially fatigued and then left in oxygen, its lactic acid concentration continually falls over a period of hours—that is, the recovery process—and the muscle becomes as capable as before of reacting to a stimulus. In such a case—regarded from the standpoint of the intact animal—the oxygen supply is grossly inadequate, owing to the slowness of its diffusion through the muscle substance from outside. The recovery process, in the presence of an adequate supply of oxygen, as in man after moderate exercise, or in the isolated muscle after a single twitch, is far more rapid. This abolition of lactic acid during the recovery process does not appear to diminish the total amount of it which can be obtained later from the same muscle by stimulation, by mechanical injury, or by heat rigor; either it is not oxidised but rather restored to some previous position in the chemical architecture of the muscle, or there is some limit to the lactic acid concentration set by its own presence there, for example, by the rise *in hydrogen-ion concentration* which it causes. We shall see later that both explanations are essentially true.

These experiments of Fletcher and Hopkins, which have been fully and widely confirmed since by Meyerhof and others, were obviously of fundamental importance in the study of muscle. They were the starting-point of the investigation which Prof. Langley proposed to me in 1909, as they were the basis of Meyerhof's recent work. They clearly opened up all kinds of problems—what happened to the lactic acid when it was removed in recovery? How long did the process take when the oxygen supply was adequate? Was the lactic acid the essential link in the chain of muscular contraction, or only a by-product to be got rid of as soon as possible? Many of these questions have since been answered, largely by the aid of experiments on the heat production of muscles under various circumstances.

HEAT PRODUCTION OF MUSCLES.

There is a special advantage in studying the heat production of muscles; this will be obvious to any who, in these mechanical days, like to regard the muscle as a machine. The first and most important factor in a machine is the amount of energy which it uses. A much more important advantage, however, in studying muscle is the fact that *heat* measurements can be made without injuring the tissue, continuously while the processes inside it are going on. To study the *chemical* changes in a muscle requires us to destroy it each time we make an observation. The sensitivity, moreover, of the thermo-electric method, applied to measurements of heat in muscle, is so great that it is possible to examine, during and after a single twitch, the processes which can be studied by chemical methods only after severe activity.

RIGOR MORTIS.

We have learnt a great deal in this connexion from the study of rigor mortis. When a frog's muscle is warmed to 35° C. or more it goes rapidly into rigor, the only chemical process known to accompany this condition being the production of lactic acid—as Fletcher and Hopkins showed—followed by the effect of the acid in producing stiffness or coagulation of the muscle substance. The heat liberated during rigor is one to two calories per gramme of muscle. Seeing that no chemical processes are known to accompany rigor except the lactic acid production, it was natural to attribute this liberation of heat to the unknown process by which the lactic acid also is liberated. This rigor heat is considerably reduced by previous injury, by prolonged anaerobic survival, or by stimulation. The same heat may be liberated in rigor produced by chloroform; it also is reduced by survival without oxygen and by fatigue. Its level is restored by oxygen after fatigue, and maintained at a high level during resting survival in the presence of oxygen. The heat liberated per gramme of lactic acid was estimated roughly in 1912 as being about 370 calories. Recent and much more accurate measurements by Meyerhof have confirmed this value. Peters, in 1913, found that the heat liberated during stimulation to complete fatigue is about 0·9 calories per gramme. The heat liberated in subsequent rigor is about 0·87 calories. Rigor in the unstimulated muscle gave about 1·7 calories. Stimulation of fresh muscles leads to the liberation of about 0·2 per cent. lactic acid; rigor to one of about 0·4 per cent.; stimulation followed by rigor also to about 0·4 per cent. *Hence it is obvious that lactic* acid and heat formation run parallel to one another, and that rigor and anaerobic activity involve the same chemical change—namely, the production of lactic acid from some precursor with the liberation of about 370 calories for every gramme of acid set free.

ORIGIN OF LACTIC ACID.

This determination of the heat production associated with the formation of 1 g. of lactic acid, either in rigor or in the anaerobic activity of muscle, enables us to decide with fair certainty what are the chemical reactions associated with contraction, and from what substance the lactic acid arises. Now, it is probable on other grounds that glycogen is the precursor of lactic acid. The heat of combustion of dissolved glycogen ($(C_6H_{12}O_6)n$ has been determined by Slater as 3836 calories, *that of lactic acid* ($C_3H_6O_3$) by Meyerhof as 3601 calories per gramme; the formation, therefore, of lactic acid from glycogen is accompanied by the liberation of 235 calories per gramme. Now, as we shall see shortly, this lactic acid never occurs as such to any appreciable degree inside a muscle; it is always there neutralised in the form of sodium or potassium lactate. There are grounds for believing that the neutralisation takes place at the expense of a sodium protein salt, the alkali protein substance of the muscle itself. According *to Meyerhof the heat* of this neutralisation is 135 calories, so that the total heat associated with the formation *of lactic acid from* glycogen and its subsequent neutralisation would be 370 calories. This is precisely the amount of heat set free when 1 g. of lactic acid is formed inside a muscle during activity or rigor. It is obvious, therefore, that in the initial process of contraction and relaxation—i.e., apart from recovery—no chemical change of any importance occurs except the formation of lactic acid at the expense of glycogen and its subsequent neutralisation. There may be small, and from the energy standpoint unimportant, side reactions, but *it is a* great simplification to know that the fundamental chemical process underlying a contraction is *simply the formation* of lactic acid from glycogen.

That glycogen is, indeed, the precursor of lactic acid in the muscle is shown by the direct determinations of Meyerhof, which have been confirmed in Hopkins's laboratory. *During* anaerobic activity, or survival, glycogen disappears from the muscle and lactic acid appears in *exactly* equivalent amount; CO_2 is driven out by the lactic acid from the bicarbonate present in the muscle; heat is liberated proportional to the lactic acid. No change, however, is observed in the fat, and the lactic acid maxima are, in exercise 0·25 to 0·4 per cent., in rigor 0·4 to

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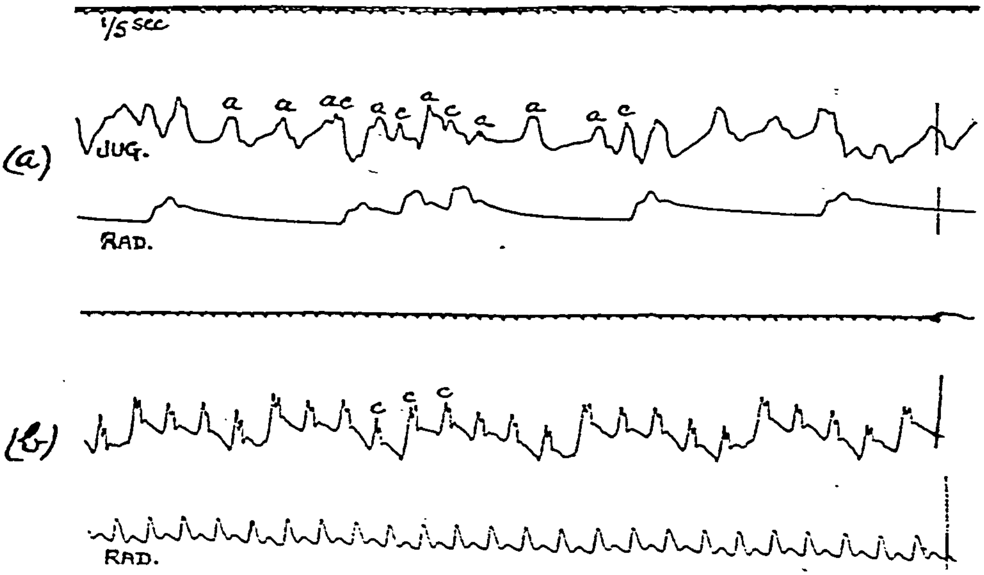

Polygrams: (a) Before adrenalin; severe heart-block with a ventricular rate of 28, except for occasional A-V :: 1:1 beats. (b) Twelve minutes after a subcutaneous injection of adrenalin (♏x.); rate 110.

A man of 44, a cook, was admitted to hospital at 7 P.M. on Feb. 22nd, 1924, with a history of good health until the previous day, when at 9 A.M. and again at 11 A.M. he noticed for a few seconds a mist in front of his eyes. At 1 P.M., while serving dinners, he lost consciousness and fell. He was picked up having recovered consciousness, and went on working. At 2 P.M. he had a similar attack in which he bruised his head, and at 2.10 P.M. he had a third. He went home to bed and there had three more attacks. He passed a good night but woke with throbbing pains in the head followed by several attacks. From that time there were no more till after admission.

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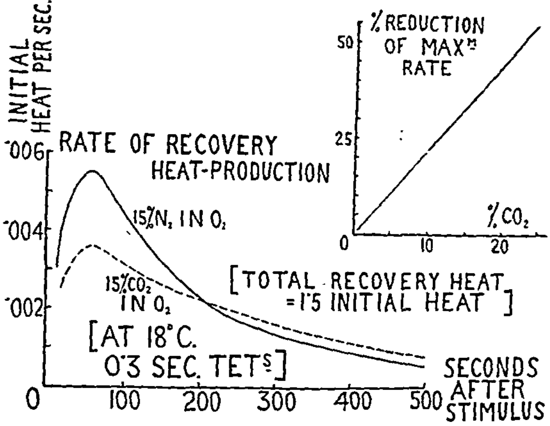
THE RECOVERY HEAT PRODUCTION.

In the analysis of the heat production of the live muscle the first result we obtain is that a large amount of heat is liberated directly the contraction begins; then there is a pause, and again there is a liberation of heat during relaxation. It is natural to associate the first production of heat with the formation of lactic acid from glycogen, the second production of heat with the neutralisation of the lactic acid. It is soon found, however, that the heat production is not finished when the muscle has relaxed; the deflection of the galvanometer when the muscle is in oxygen returns only slowly to zero, far more slowly than in a dead muscle warmed suddenly at the beginning. This can be due in the live muscle only to a continual formation of heat for long periods after the contraction is over, this heat maintaining the temperature of the thermopile and the deflection of the galvanometer. This recovery heat production, as it is called, goes on for 10 to 20 minutes at room temperature (Fig. 2); at 0° it may be apparent nearly an hour after the stimulus. It is clearly concerned with the oxidative removal of lactic acid, which was found by Fletcher and Hopkins to occur in oxygen after activity. It is not affected, however, by diffusion, since the muscle contains, dissolved in its own substance, more than enough oxygen to account for the small amount of heat actually liberated in recovery from a single contraction. We do not know in detail what the events are which occur during this restoration process. The curve, however, of the recovery heat production represents the thermodynamic outline into which must be fitted the picture of the recovery process as a whole, which will be painted in the future by the biochemists.

FIG. 2.



Factors Affecting the Speed of Recovery.

It is noticeable that the rate of the recovery process increases, not only absolutely but relatively, when the extent of the initial breakdown is greater. Recovery appears to be determined by some kind of bi-molecular reaction. The presence of lactic acid in the muscle is a sensitive "governor" of oxidation; the speed of the latter increases as the square of the concentration of the former. This may not seem in itself of great practical account; we shall see, however, in the next lecture how large a determining factor it is in the degree of fatigue resulting from a given amount of muscular exercise.

The recovery heat production is affected by a variety of factors. A rise in hydrogen-ion concentration (see Fig. 2) diminishes its rate, while leaving its total magnitude unaltered. A large decrease in the rate of recovery may be produced by a comparatively small rise in the hydrogen-ion concentration inside the muscle fibre. This is analogous to the effect produced by hydrogen-ion concentration on the rate of autoxidation of cysteïn or glutathione, or, according to a private communication from Prof. Meyerhof, of the oxidation of fructose in the presence of phosphates. The rate of recovery is increased by a rise of temperature; it is diminished by soaking the muscle for some time in Ringer's solution—possibly the soaking of the muscle removes some oxidising catalyst analogous to Hopkins's glutathione.

Chemical Events in Recovery.

I said that the curves of the recovery heat production represent the thermodynamic outlines of the future chemical picture. Fortunately, some details of that chemical picture are already known and fit well into the outline. In a muscle kept in oxygen no lactic acid ever appears; lactic acid already formed disappears; oxygen is used and carbon dioxide is produced in excess of the resting values. The excess CO_2 is equal to the excess oxygen—i.e., the R.Q. of recovery is unity. The restoration process, therefore, in the isolated muscle (probably not in the intact animal) involves the oxidation of something with the general formula of carbohydrate. There is no sign of change in the fat inside the muscle; heat, as we have seen, is liberated, and—most important of all—*glycogen has been shown by Meyerhof to be re-formed.*

From the oxygen used and the CO_2 produced we may calculate the carbohydrate oxidised. The amount of glycogen re-formed, plus this amount of carbohydrate oxidised, is shown experimentally to be exactly equal to the amount of lactic acid which has disappeared. It would seem, therefore, that the lactic acid is mainly or entirely re-formed into glycogen during recovery, but that a certain amount of energy (obtained from the oxidation, either of a part of the lactic acid, or of carbohydrate) is necessary in order to force the reaction backwards. The matter is best discussed from the purely energetic standpoint.

In the anaerobic process of activity—the process producing fatigue—glycogen becomes sodium lactate with the evolution of 370 calories per gramme of lactic acid. In the recovery process the reaction is reversed, sodium lactate becomes glycogen, and 370 calories therefore of energy must be absorbed. This in itself would lead to a cooling of the muscle. Actually Hartree and I have found that in the process of "recovery" there is an extra oxidative heat production almost exactly equal to the total anaerobic heat production of the previous process of "fatigue." The total recovery heat, therefore, is 370 calories, so that the total energy liberated in recovery is 740 calories. The heat of combustion, however, of dissolved glycogen is 3836 calories. Hence, in the complete cycle by which 1 g. of glycogen becomes 1 g. of lactic acid and then is restored from the acid, the fraction $740/3836 = 0{\cdot}193$ g. of glycogen must be oxidised to provide the necessary energy. The initial process of contraction is forced backwards by the energy liberated in this oxidation. This reversal is the recovery process.

"Efficiency" of Recovery.

The ratio of the lactic acid removed during recovery to the lactic acid, or carbohydrate, oxidised to provide the necessary energy for its removal, may be called the "efficiency of recovery"; it appears to be about 5·2 : 1—five to six molecules are removed for every one oxidised. Direct chemical measurements by Meyerhof of the glycogen and lactic acid showed that the efficiency of recovery is about 3 or 4 : 1. In these experiments, however, owing to the slowness of oxygen-supply by diffusion, the process was a very prolonged one and involved considerable oxygen-want; the efficiency of recovery may well have been less. It has proved possible on man to make similar observations of the efficiency of recovery; they have led to values similar to that obtained on isolated muscle. These values are perhaps the best reward we have had for the faith that nature is consistent. I will discuss them more fully in my next lecture.

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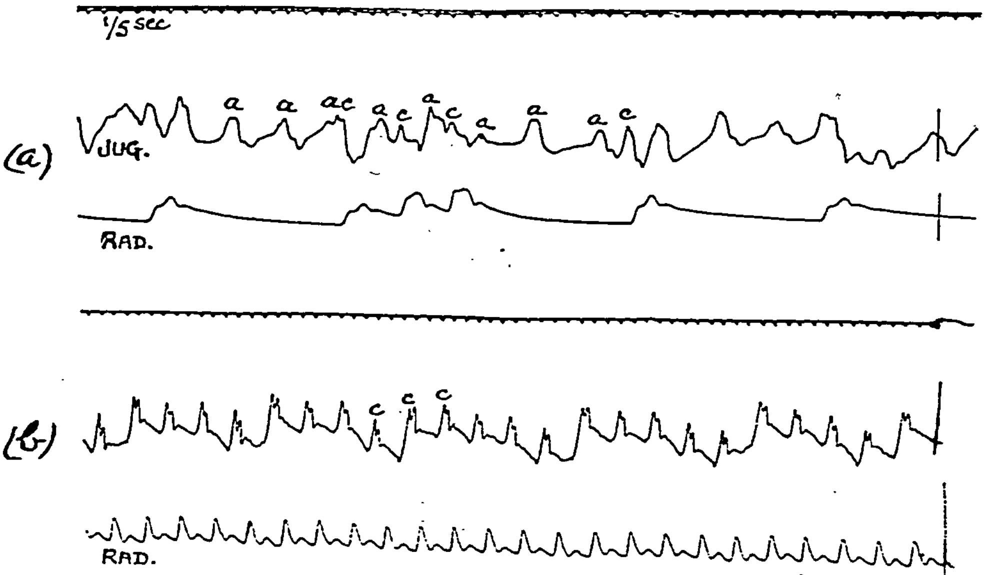

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[1] Phear, Arthur G., and Parkinson, John: The Lancet, 1922, i., 933–936.

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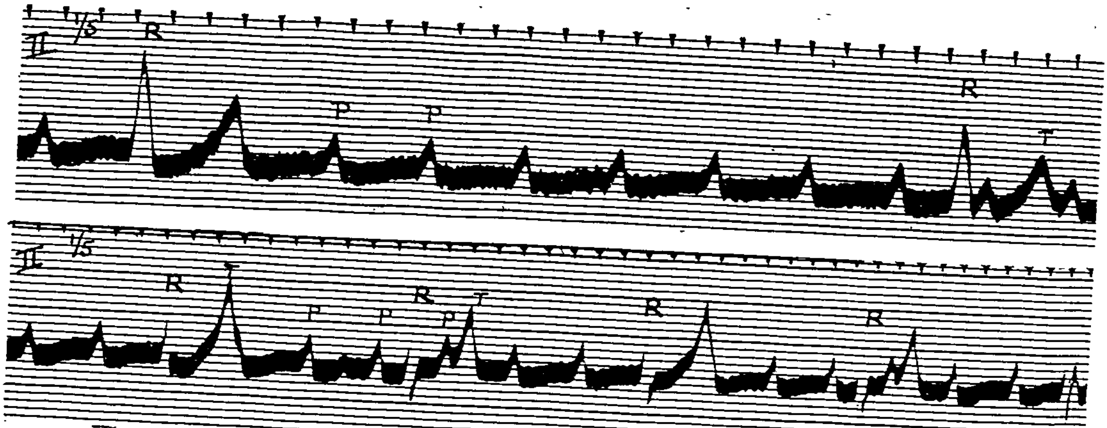
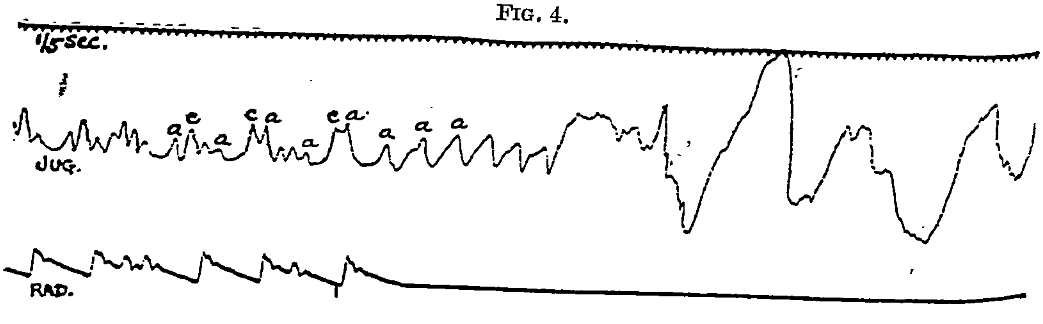


Electrocardiograms: (*a*) Before adrenalin; complete heart-block, P = auricular systole, R–T = ventricular systole; auricular rate 110, ventricular rate 12 a minute. (*b*) Ten minutes after a subcutaneous injection of adrenalin, ♏x. (0·6 c.cm.); complete heart-block; auricle 112, ventricle 33.

Second Phase.—During the next 12 days dissociation remained complete, though the ventricular rate varied within wide limits, the lowest recorded being 12 per minute (Fig. 2) and the highest 60. Syncopal attacks occurred irregularly, the patient enjoying complete freedom for one period of four days. No relationship could be traced between the changes in ventricular rate during complete block and the liability to syncopal attacks. Adrenalin was given on five occasions. It invariably abolished the attacks for some hours, but it never caused any reduction in the block when this was complete. The ventricular rate was increased to about 60 a minute, but never higher, while that of the auricle rose to 115. Thus a slow initial ventricular rate was considerably accelerated, while on one occasion when the rate was 60 before the drug was given, it was unaffected. The patient by this time had come to regard adrenalin as a specific for his attacks and begged for its regular administration to anticipate and prevent recurrence. It was thought better, however, to reserve it for occasions when the attacks were frequent.

FIG. 4.



Continued on opposite page.

Polygram showing the whole of a Stokes-Adams attack. *a* = auricular wave; *c* = carotid wave. After a short period of partial heart-block there is ventricular standstill for 18 seconds. Convulsive movements are indicated towards the end of the record, following stertorous breathing.

Third Phase.—Fourteen days after admission there was a sudden increase in the frequency of the attacks so that 100 were charted in a single night. The attacks were all of the same type but of variable duration. The patient became pale and the pulse stopped; he then lost consciousness and the breathing became stertorous; then in the longer attacks he was convulsed for a few moments (see Fig. 4). It will be noted that before and after the attack there is present a varying but always incomplete block with some A-V 1:1 beats. Before adrenalin was given on this occasion attacks had been recurring almost every minute for an hour. A continuous polygram showed an attack at the moment of injection, another one minute after, and then no more. The rate rose to 120 in 20 minutes, apparently with 1:1 rhythm as in phase 1. After two hours' freedom the attacks recommenced and 80 were charted during the next 12 hours. Adrenalin was then repeated and he slept undisturbed for six hours. Again the attacks recurred, and this time adrenalin was given promptly, preventing further attacks as expected. During the rapid rate which in this phase always followed the injection, an electrocardiogram was taken (Fig 3). It will be seen that normal A-V sequence is present, with a slightly prolonged P-R interval.

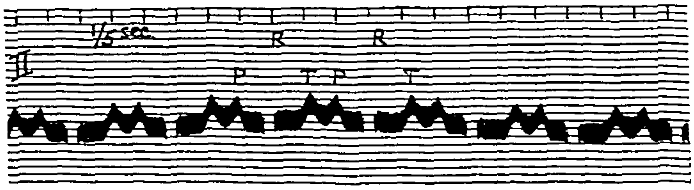
Two days later the attacks ceased altogether, and in three more days it was found that the heart had spontaneously reverted to normal rhythm. During the next five weeks he remained free from attacks and felt well, and electrocardiograms now always showed a normal rhythm. He remains well six weeks after discharge from hospital.

Discussion.

In their review of the literature, Phear and Parkinson came to the conclusion that there was sufficient evidence to show that partial heart-block may be reduced and even complete block abolished by the injection of adrenalin, while an increase in ventricular rate is usually obtainable. In their patient, as in Feil's, after the failure of atropine, adrenalin stopped the attacks; but the complete block present in both cases was unaffected and the rate was not increased at the time.

In the case here described, there appears to have been an acute lesion of the myocardium involving the auriculo-ventricular bundle, with a rapid onset of heart-block, and a period of complete dissociation followed by a more gradual recovery of conduction. Stokes-Adams attacks occurred in all three phases, but much the greater number took place during recovery of conduction. Opportunity was therefore afforded for studying the action of adrenalin both when the block was partial and when it was complete. On the 12 occasions on which it was used, with one doubtful exception, it abolished the attacks within three minutes; and freedom from attacks was maintained from 2 to 48 hours from the time of injection. On four recorded occasions when partial block was present, the auricular and ventricular rates both increased to 120 and normal auriculo-ventricular sequence was restored. When complete block was present and the ventricular rate was slow, this was increased to about 60, but the block remained complete. On one occasion, when the ventricular rate was already 60 before the injection, no increase in rate took place.

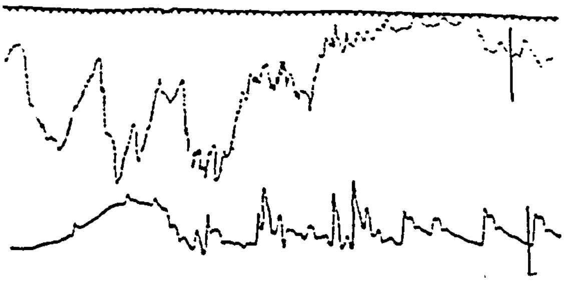
FIG. 3.



Electrocardiogram taken during the rapid heart action following adrenalin. P = auricular systole; R–T = ventricular systole. The P–R interval is slightly over one-fifth sec.; 1 : 1 rhythm is shown, at a rate of 100 a minute.

It must not be expected that adrenalin will succeed in every case showing Stokes-Adams attacks. We have seen two cases where the clinical effect of adrenalin was disappointing. 1. In a man of 72 with complete heart-block convulsive attacks were occurring at least every hour, two being observed in the 20 minutes preceding the injection of adrenalin ♏v. (0·3 c.cm.) On this occasion no more occurred for two hours, yet on the following day more severe attacks were uninfluenced by ♏x. (0·6 c.cm.) and the patient died in an attack, though ♏xv. (0·9 c.cm.) had been injected subcutaneously ten minutes before. 2. In a man of 70 with complete heart-block and syncopal attacks recurring several times daily, adrenalin ♏v. failed to affect either the auricular or ventricular rates (A-V : : 90 : 25) and an attack occurred 35 minutes after the injection.

FIG. 4—(*Continued.*)



The usual treatment of Stokes-Adams attacks in respect of drugs is the subcutaneous injection of atropine. This treatment is largely based upon the fact that where partial heart-block is present atropine by its action on the vagus may facilitate conduction and, in so far, may increase the ventricular rate. Where the heart-block is complete, it is not capable of increasing the rate of the ventricle. Whatever the block, it is only where the attacks depend upon strong vagal influence—a rare event—that atropine might be expected to succeed. Clinical experience confirms this and shows that it is most uncommon for atropine to control attacks.

On pharmacological grounds adrenalin might be expected to have a wider application than atropine in the treatment of Stokes-Adams attacks. It can facilitate conduction when partial block is present. What is more important is that it can directly increase the rate of a dissociated ventricle. Further, it has now been shown clinically that, even if the block is uninfluenced and the ventricular rate is not increased, adrenalin can abolish the recurrent standstill of the ventricle which under these conditions determines the syncope.

We are of opinion that the subcutaneous injection of adrenalin, 5–10 minims (0·3–0·6 c.cm.) of the 1 : 1000 solution, is the most promising method of treating Stokes-Adams attacks, and should therefore be tried in every case.

MENTAL DEFECT AND MENTAL DEGENERACY IN A RURAL AREA.

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THIS paper is based upon information obtained in the ascertainment of mental defectives among school children in a rural area during a period of two and a half years, beginning in January, 1921. It is laid down in the Mental Deficiency Act of 1913 that it is the duty of a local education authority to ascertain the number of mentally defective children in the school population; but where, as in most rural districts, no special schools are available for mentally defective children, this Act has for the most part been a dead letter. Hence, mainly, the very varied nature of the figures quoted as to the number of mental defectives in rural areas. It is hoped that the present paper, based upon information as complete as possible under existing conditions, will serve as a contribution to knowledge of the problem of mental defect as it exists in rural areas.

Method of Ascertainment.

As the routine medical inspection of the children in the area under investigation is done by me, I have examined the greater proportion at some time or another. Opportunities occur during a routine inspection of noting children who require special examination for mental defect. Such points as an obviously abnormal manner and appearance, or an unduly low school standard for the age, may serve as indications for special examination. But it must not be supposed that more than a minority of mental defectives can be picked out by such indications. The greatest reliance has to be placed on the teacher in bringing forward suspected cases, or those who are exceptionally backward. But I have been struck by the fact that in many instances teachers have failed to recognise even cases well below the border-line of mental defect as feeble-minded, cases which would therefore have escaped notice had their recognition depended entirely on the teacher. In the present area and probably in other areas also—though I have no experience of them—a large proportion of teachers regard mental defect or a congenital low level of intelligence as the *last* cause to be thought of in explaining cases of failure to make normal progress. They tend to assume that bad home conditions, frequent migrations, too large families, are the actual causes of retardation of intelligence, whereas these conditions are often themselves the evidence of, and the result of, a low level of hereditary intelligence in the family. Moreover, children who are very much retarded in intelligence are frequently found advanced a standard or two above that which is really suited to their mental age, though still in a standard below that appropriate to their chronological age.

It is, however, not surprising that many teachers should fail to realise the all-importance of innate or hereditary qualities, and lay undue stress on environment, for the greater part of our educational system is built upon the assumption that all children, with only trifling exceptions, are essentially equal in innate intelligence, that is, in their capacity to receive and profit by an education substantially the same for all. I think it probable, therefore, that the figures I have obtained are far from representing the total. In order to be certain that they are complete, it would be necessary either to subject all children to some form of group test, which would clearly indicate those falling below a certain level of intelligence, and, therefore, requiring individual examination; or that teachers generally should have a more adequate knowledge in the matter of mental defect, so as to be better able to select those children who should be specially examined.

The method of special examination referred to consists of a physical examination, a mental examination, an inquiry into the educational progress, the conduct, temperamental conditions, and social relations of the child, and an inquiry into the family history, including in most cases a visit to the home of the child.

The examination by means of intelligence tests forms a very important part of the investigation. In the present series the Stanford revision of the Binet-Simon tests was used in all cases. For those who are unfamiliar with them a few words on the general principles of these tests may not be out of place. They depend on the fact that native intelligence—or the capacity for making mental acquirements as distinct from the acquirements themselves—develops gradually from birth up to the age of about 16. In bright children the intelligence develops at a quicker rate and reaches a higher level than in average children; while in dull children the reverse is the case. The tests themselves consist of a number of questions, problems, and the like, graded in difficulty, and with a definite standard of success or failure. From the number of successes in these tests it is possible to calculate the mental age of a child, as distinct from his chronological age. In a bright child the mental age will be above the chronological age; in a dull child it will be below. In a strictly average child the two ages will, of course, correspond. The ratio between the mental and the chronological age, the latter being taken as 100, gives a measure of the intelligence of the child, and is known as the intelligence quotient, or shortly as the I.Q. This I.Q., being a measure of native intelligence, is little influenced by ordinary variations of environment or education, and tends to remain constant through all ages. Average intelligence is indicated by I.Q.'s of 90 to 110; superior intelligence by I.Q.'s above 110; and very superior intelligence by I.Q.'s above 120. I.Q.'s of 80 to 90 rank as dull normal; I.Q.'s of 70 to 80 as bordering on mental defect; while I.Q.'s below 70 indicate definite mental defect.

There are factors other than the I.Q. which have to be taken into account in forming a final opinion as to mental defect. It may, for example, be necessary owing to definite abnormalities in conduct or temperament, to regard some cases with I.Q.'s between 70 and 80 as feeble-minded. In the present investigation all cases with an I.Q. below 70 have, with very few exceptions, been classified as feeble-minded, or if below 50 as imbecile. Some cases with an I.Q. between 70 and 80 have been regarded as feeble-minded on the strength of other abnormalities in the mental make-up. I feel that in this latter group more cases should have been regarded as feeble-minded than were actually so classified, and that in these cases abnormalities of conduct will show later that they really belong to the feeble-minded group. As indicated above, an I.Q. of 50 has been taken as the dividing line between the feeble-minded and the imbecile groups. The I.Q. is, of course, no guide in the diagnosis of moral imbecility, except in so far as a moral imbecile is by definition distinct from a feeble-minded person or an imbecile. In some low-grade cases also anything like an intelligence test is clearly quite out of the question. It is possible that, when adults are considered, the above-mentioned limits for the I.Q. are not strictly accurate, but as in the present investigation only children were examined by this method, any difficulty here need not concern us.

Before concluding these remarks on diagnosis I should like to emphasise the fact that, in order to obtain a satisfactory picture of a child specially examined, it is necessary to take into consideration not only the I.Q. but also facts from all available sources as to the behaviour of the child in relation to its environment, the nature of that environment, and the type of family of which the child is a member.

Statistical Results.

The total number of school children which came under review was 4979. This number was contained in a continuous area comprising part of the county of Wiltshire. A municipal borough, which is situated in the area, but which is educationally autonomous, was not included; nor was a similarly situated urban district with a population of 5500, the schools in which I have only recently taken over. The girls' and infants' schools of a second urban district with a population of 2000 were also excluded, as they are not inspected by me. With the exception of the boys' school in the last-named district, which has a number of about 110 on the roll, all the remaining schools are included in five rural districts with a total area of 373 square miles, and a total population of all ages of 36,243 in 1921. The area concerned is therefore very sparsely populated, and consists of scattered villages, in which the predominant occupations are agricultural.

The total number of mental defectives of all grades ascertained was 168. Of this number 140, or 83 per cent., have been classified as feeble-minded, and 27, or 16 per cent., as imbeciles, the remaining one being a moral imbecile. Some of the imbecile group have never attended school, and an additional number have been excluded from further attendance. (I have taken no account of a small number of idiots seen from time to time, as such low-grade cases do not always come under my cognisance.) For the reasons stated above it is probable that the number of feeble-minded children ascertained falls short by a good deal of the number that have been actually present during the time under review. I am inclined to think that the numbers found should be increased by anything up to 50 per cent., or even more, in order to obtain the actual numbers that have been present.

This opinion is confirmed by the diagram (to which attention will be called below) showing the distribution of the I.Q.'s of the cases examined and classified as mentally defective. Each rectangle represents the number of cases the I.Q.'s of which fall within limits of five points. It will be seen that in the diagram the highest rectangle corresponds with the group 60 to 64, while that corresponding with the group 65 to 69 is lower. According to the curve of normal distribution, which has been found to be approximately followed, when large numbers of unselected children have been examined, the rectangles should be increasing steeply in height at this point. In the present diagram some part of the irregularity may be due to the comparatively small numbers examined, but part is almost certainly due to the fact that the higher-grade cases are more frequently missed owing to reasons given above, and therefore not included. (This argument is, of course, valid only for I.Q.'s below 70, above which point only a small proportion of those cases actually examined has been included in the diagram, the remainder not having been classified as feeble-minded.) It is probable also that the number of imbeciles is not complete, as the lower grades are not usually sent to school, and their existence is sometimes not known.

In order to obtain an accurate idea of the number of defectives present at any one time in the total school population, certain corrections must be applied to the figures as actually found. Very few defectives are examined by me before they reach the age of 7, and of this small number all but one have now reached that age. Not the total school population, therefore, but that part only which has attained the age of 7 should be taken as the basis of comparison. This number should be brought into relation with the number of defectives between the same ages. Those defectives, therefore, who have now attained the age of 14, the present school-leaving age, must be subtracted from the total number, as well as those defectives who have left the district between the time of examination and the time of writing. As the schools are visited at least every six months, and most defectives are kept under supervision by the Voluntary Association for Mental Welfare, this last number may be taken as accurately known. The corrected figures may be given in tabular form thus:—

Total school population between ages of 7 and 14	3868
Mentally defective children between the same ages at present in district*	116
Imbeciles included in above	19
Feeble-minded included in above	96
Percentage of imbeciles..	0·5
Percentage of feeble-minded	2·5
Percentage of all grades of mentally defective	3·0

* Including one moral imbecile.

Those children who have been sent by the local authority to institutions outside the area are included.

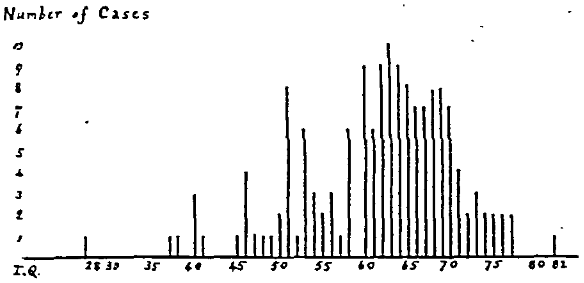
We find, therefore, that there are 3 per cent. of ascertained mental defectives of all grades among children who would ordinarily attend public elementary schools. These figures are as accurate as it is possible under existing conditions to make them. If we are correct in thinking that the percentage ascertained falls considerably short of the real number present, we shall perhaps not be far from the mark in assuming that the true percentage of defectives of all grades lies somewhere in the neighbourhood of 4, or perhaps higher. But, even if one assumes that the lower figures are correct, they are much above those given for towns which have been adequately investigated. Burt, for example, taking an I.Q. of 70 on his own scale as the dividing line, finds that in London 1·5 per cent. of all children (not including in this number the imbeciles) fall below this line and are eligible for special schools. The corresponding figure in the present investigation is 2·5 per cent. The causes of the greater prevalence of mental defect in rural districts will be indicated later.

Distribution of Intelligence among Defective Children.

We may next consider the distribution of intelligence among children ascertained to be defective, and this is best shown by diagrams. The I.Q. was, apart from one or two exceptions to be noted, in all cases carefully taken by myself in accordance with the directions given in Terman's book on the "Measurement of Intelligence." In the majority of cases the longer series of tests was used, in the minority the shorter series of the starred tests only. In these cases the I.Q. may be relied upon as being as exact as careful testing combined with experience in giving the tests can make it. In rather less than half (13 out of 27) of the imbecile group, that is, those whose I.Q.'s fall below 50, the I.Q. was not taken, owing to the fact that it was not possible to test the children, the cause being generally too low a level of intelligence, though in some cases temperamental conditions formed the obstacle. In only one case was there a failure to get the I.Q. in the feeble-minded group owing to the extreme difficulty in securing responses. This was in a girl of nearly 14. I have put her I.Q. as 50 for the purpose of the diagram, but this must be regarded as largely a guess from general considerations. Two other cases were also classified as feeble-minded, which were not examined in sufficient detail to make even a guess at the I.Q. possible. In a few cases the same child was retested after an interval, perhaps two years or more, generally with the result that there was an insignificant difference in the I.Q. In these cases the first result only has been used for the purpose of the diagrams. The detailed distribution of the I.Q.'s is shown in Diagram 1, where all grades of the mentally defective have been included, but not the dull and backward. The case which stands apart from the others with an I.Q. of 82 has been certified as a moral imbecile and is now in an institution; he has a feeble-minded sister with an I.Q. of 70 in the same institution. The distribution under larger groups, namely, five points of the I.Q., is shown in Diagram 2, to which reference has already been made. In the lower line the actual numbers contained in each group are given. As above stated, the figures for the imbecile group represent only about half of the actual numbers examined, the remainder being unclassifiable in terms of the I.Q. A considerable number of children who were found to be classifiable as dull and backward only were also examined in sufficient detail for a determination of the I.Q. to be possible. But as this number represents, of course, only the fringe of the total group of the dull and backward—namely, those who were suspected of mental defect—it is impossible to draw any conclusions from the actual numbers so found or from the distribution of the

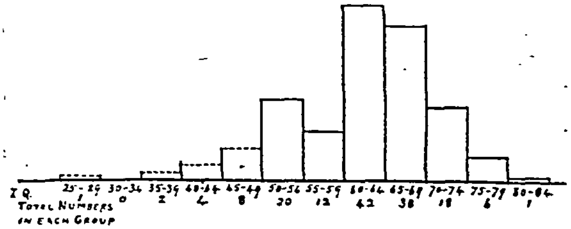
Diagrams Showing the Distribution of the I.Q.'s in the Feeble-minded and Imbecile Groups.

DIAGRAM 1.



The number of cases for each I.Q. is shown by the height of the vertical lines over the base line.

DIAGRAM 2.



The rectangles for the groups below 50 do not represent the total numbers in these groups, as is indicated by the broken line at the top.

I.Q.'s. As might be expected the majority of the I.Q.'s fall into the border-line group of 70 to 80.

In this connexion it is interesting to compare the results obtained in a school where all the children were examined. The school was in the area in question and contained 50 children. Among these unselected children the average I.Q. was 94, which is rather below the average found by Terman, as might on several grounds be expected. The highest I.Q. was 137, and the lowest 47. There were four children who fell below the border-line of mental defect, whose I.Q.'s were 47, 62, 66, and 67. The two last are members of the family reported in detail below.

With regard to the distribution in individual schools of the mental defectives, this is very variable, as would be expected where the schools are small ones. There are in all 80 schools in the area, and the variation is from *nil* in some schools to nearly 10 per cent. in others. Part of the variability is probably only apparent, and due to incomplete ascertainment; of the part that is real some is due to the smallness of the numbers involved; while some is the result of local conditions, including the nature of the employment available, the greater or less desire of the employers to get a good type of employee, and other conditions which determine the type of family to be found in a given locality.

Characters of Mental Defectives.

The problem before us now is to consider the future of these mentally defective children when they reach adult life. The imbecile group are in most cases necessarily incapable of even partial self-support. They either find their way into institutions or remain as burdens on their families. Though to the uninstructed this group forms the most obvious part of the problem of mental defect, it is far less important sociologically than the higher group. What follows will relate almost entirely to the feeble-minded.

Unfortunately I have no personal experience of the problem of mental defect as it exists in towns. It is, I think, generally admitted that a lower level of intelligence is required for self-support in rural areas than in towns, owing to the simpler conditions of environment. Moreover, the opportunities for adopting evil courses are fewer in the country than in the town, and for this reason mental defectives in the country are less likely to come in contact with the police. We might expect to find, therefore, as we actually do find, a larger proportion of mental defectives existing in the country than in the towns; but that many or most of these defectives are capable of more or less complete self-support; and that their mental defect is evidenced, not in most cases by such gross abnormalities of conduct as would be likely to bring them into conflict with the forces of law, but simply by a very low level of intelligence. As a result of this low level of intelligence their self-support tends in many cases to be only partial, and to be supplemented by a greater or less amount of relief from the guardians or from private charity. We find in rural districts, as well as in towns, that the feeble-minded exhibit complete improvidence in marriage and the production of children; their families are usually chronically filthy and neglected, and they are incapable of maintaining any standard of life in the home. The girls frequently become the mothers of illegitimate children.

We must also recognise that, whatever may be the number of actual defectives present, this number represents only the fringe of a very much larger class of subnormal and degenerate individuals, whose capacity for mental development is very limited, whose sphere of usefulness as citizens is correspondingly circumscribed, who may indeed be a burden rather than a help to the community, who tend to transmit to their offspring hereditary qualities of degeneracy and defect, and who, owing to a high reproduction rate, are increasing in numbers relatively to the rest of the community.

Owing to the fact that the present investigation has been in progress for less than three years, it has not been possible to follow children from school up to adult life. But reports on the subsequent progress of a few of the children who have now left school are available. The boys appear in most cases to be employed in helping their fathers or in doing odd jobs on the land; sometimes they are capable of earning a normal boy's wage, but in other cases are unemployable. The girls appear usually to help in the home, and probably the majority will be sent out to service later on.

The best picture of what the feeble-minded child is likely to become may in many cases be obtained from the parents. The father is usually not seen when the home is visited, but in a large proportion of cases the mother appears, from the impressions formed in an interview, which are often confirmed by common repute, to be of very low intelligence. In some cases it is even possible to see in the course of a brief conversation that she is feeble-minded, in which case she exhibits the characteristics above mentioned.

Descriptions of Individual Families.

The following descriptions of individual families will serve to illustrate the characteristics of mentally defective stocks as they exist in a rural area.

H. family. The mother is obviously feeble-minded, almost at first glance, and is generally recognised as such. The father I have not seen, but he is in regular work at a weekly wage of 27s. When I last saw the family a few months ago there were six children, ranging from 15 to a little over a year in age, and a new baby was imminent. Owing to difficulties in getting anyone to undertake the care of the mother during confinement it was suggested that she should have her baby in the workhouse, which, in fact, she actually did. When I first saw the family in 1921 there were three children at school, in a filthy and very offensive condition, and the state of the home corresponded with that of the children. The family has since been under the regular and frequent supervision of the National Society for the Prevention of Cruelty to Children, and conditions have improved somewhat, but are still very bad. The three children at school were examined in 1921 and their condition was as follows: C—, male, aged $11^{9}/_{12}$ years, feeble-minded, I.Q. 63, harmless and well-behaved; will probably have enough intelligence for work on the land. R—, female, aged $9^{5}/_{12}$ years, feeble-minded, I.Q. 51, physically very poorly developed; probably has not enough intelligence to be even partially self-supporting. This child has now been sent to a special residential school. Q—, female, aged $5^{8}/_{12}$ years, dull and backward, bordering on feeble-mindedness, I.Q. 76, too early to give a definite opinion as to whether she may not be ultimately certifiable as feeble-minded. I have not examined the eldest boy or the younger children.

The salient points about this family may be summarised as follows. Mother feeble-minded and quite unfit to look after a family; two at least out of three children examined feeble-minded, and doubtless a proportion of the rest.

B. family. Father employed on a farm; mother not obviously feeble-minded; the children are rather badly kept and appear poorly nourished. There have been 15 children in the family, of whom 13 are now living. The elder boys are employed on the land and the elder girls in domestic service. All the four children at school between the ages of 7 and 14 were examined by me in October, 1922, and their condition found as follows: P—, male, aged $11^{10}/_{12}$ years, I.Q. 61; S—, female, aged $9^{9}/_{12}$ years, I.Q. 64; D—, male, aged $8^{7}/_{12}$ years, I.Q. 68; M—, male, aged $7^{5}/_{12}$ years, I.Q. 65. All these four children are feeble-minded. The head mistress states: "I do not think any amount of teaching will make them normal. They have no reasoning capacity at all." The two elder boys of those examined have exhibited cruel tendencies, and one of them in a composition described an escapade in which he and his brother stamped a duck to death as the funniest thing he had seen in his life. From the headmistress's account it appears that two older brothers, who have now left school, were of the same mental level.

It seems probable, to judge from the children themselves and the family record, that these children will be capable of employment, the boys on the land and the girls in domestic service. But the boys would probably fail in a town environment. The last addition to the family of which I am aware took place just over a year ago, and has since died.

Q. family. The point of interest about this family is that I examined all the children then at school during the course of an examination by intelligence tests. There were five children attending school, of whom the particulars are as follows: L—, female, aged $12^{2}/_{12}$ years, I.Q. 66; F—, male, aged $10^{11}/_{12}$ years, I.Q. 67; C—, female, aged $9^{5}/_{12}$ years, I.Q. 86; T—, female, aged $7^{4}/_{12}$ years, I.Q. 81; O—, female, aged $5^{9}/_{12}$ years, I.Q. 90. There are in addition three other children not yet at school who were not examined, and one who died in infancy. It will be seen that the children tested range in intelligence from a low average through dull and backward to definitely feeble-minded. The home conditions are and have been deplorable, and the children are poorly nourished, dirty, and generally neglected. The family has migrated a good deal. The father is said to be a poor specimen and a bad workman. The mother appears feeble-minded. She has not the intelligence even to alter garments given to her so as to make them fit the children. The schoolmistress attributed the mental retardation of the children to bad home conditions and frequent migrations, but this does not fit the facts of the case so well as that of an hereditary defect appearing to a greater or less extent in the children, apart altogether from the general truth that the I.Q. gives a measure of native intelligence which is but little altered by ordinary variations of environment. C—, for example, has a slightly higher mental age than L— ($8^{2}/_{12}$ years and 8 years), who is nearly three years her senior in chronological age. It is impossible to explain this as the result of the environment, which has acted equally on all the children, whereas it is well known that ancestral characters are inherited to a greater or to a less extent even in children of the same parents.

T. of S. The father of the legitimate children is feeble-minded, a fact apparent on ordinary conversation. Mother is feeble-minded, or perhaps an imbecile. She is quite unable to manage her home, and the children were shockingly neglected, but have improved somewhat under the constant supervision of the N.S.P.C.C. The family, when first seen by me in 1921, consisted of three boys, and there has since been a new baby. Details are as follows: D. S., mother's illegitimate child, aged $12^{7}/_{12}$ years, I.Q. 51, feeble-minded; could not be taught even to read or write at school; since leaving school over a year ago he has done a little work in the fields, but at the time of my last seeing him in April, 1923, was not doing anything. In view of his low level of intelligence it is very doubtful if he will ever be able to obtain regular employment. His intelligence is so low that even now he cannot give the date of the year or reckon change of money. The two other children, J— and B—, aged $7^{6}/_{12}$ years and $4^{6}/_{12}$ years at the time of first examination (now 10 and 7), are both imbeciles, and have been excluded from school. In spite of his mental defect the father appears to be a steady workman.

T. of L. The children of this family are first cousins to the preceding, the fathers of the legitimate children being brothers. In this case I have not seen the father. The mother is possibly feeble-minded, but this is not immediately apparent. There were in 1921 six living children in the family, and in addition two had died, and another baby was expected in a few days. The children at school were first seen by me in September, 1921. There were four, of whom details are as follows: R—, male, aged $13^{5}/_{12}$ years, the mother's illegitimate child, but by the same father as the rest, feeble-minded, I.Q. 53, head circumference 20¼ in.; at school he could not be taught to read anything beyond a few easy words. He has now gone with the family to a different part of the county, and the voluntary visitor of the Association for Mental Welfare reported in March, 1923, that he was able to work, but that his mother's account of his behaviour left no doubt that he was defective, and stated that he was then at work. P—, male, aged 12 years, feeble-minded, I.Q. 61, of higher grade than his brother; head circumference 20¼ in. The same visitor reports that according to his schoolmaster's account he is simply rather backward in his work, owing probably to irregular school attendance and frequent migrations of the family, and that it is absurd to call him mentally defective. S—, female, aged $10^{11}/_{12}$ years, feeble-minded, I.Q. 58, head circumference 20¼ in.; there is nothing in the appearance of the child to indicate mental defect; she has a bright, winning smile, and pleasing manner. She was retested independently by another school medical inspector in July, 1923, and found to have an almost identical I.Q. of 55. The voluntary visitor again reports that according to her schoolmistress's account she is dull in some subjects, but in ordinary life she is quite normal, and expresses his doubt as to whether she is mentally defective. H—, female, aged $8^{4}/_{12}$ years, passed all the seventh year tests and was not further tested; her I.Q. was therefore at least 81 and probably higher, indicating a dull or possibly low average intelligence, not approaching mental defect; head circumference 21 in. I have not examined the younger children.

In this connexion it is interesting to note the extreme unwillingness of teachers and visitor to admit that the backwardness of the two children now at school is due to mental defect, although it brings them well within the border line of feeble-mindedness, and though the visitor admits the presence of one defective in the family. In reference to this the head circumferences are interesting. H—, who is of merely dull or possibly low average intelligence, and who is the youngest of all the children examined, has a larger head circumference than any of the rest, which is up to the average; in the case of each of the others the head circumference is an inch or more below it. The correlation between a small head circumference and low intelligence is, of course, not perfect; but in this case the facts are certainly in favour of the view that the backwardness is due to mental defect, and not to migrations, &c., unless, indeed, it is argued that migrations and irregular school attendance can cause a failure to grow or a shrinkage of the cranium.

N. family. The two youngest children of a family of seven were examined at school in May, 1921. L—, female, aged $8^{10}/_{12}$ years, feeble-minded, I.Q. 66, head circumference 18¾ in.; she was recently under treatment for gonococcal vaginitis mysteriously acquired. E—, male, aged $7^{6}/_{12}$ years, feeble-minded, I.Q. 60, head circumference 19 in. Of the remaining five children, who have now left school, it appears from the mother's description that one is an idiot, another a low-grade feeble-minded, while the other three are stated to be normal. The mother appeared normal in the course of a short interview; the father was not seen. The elder boy mentioned above as being according to his mother's account feeble-minded, recently suffered three months' imprisonment on a charge of indecent assault of a little girl of another family. There can be no doubt that he is feeble-minded, to judge both from his school record and his mother's account, but the question never came before the bench.

I have selected the above families for special report, both because they are some of which I have most complete records, and because they are illustrative of the characteristics of defective families as they exist in a rural area. They are, it is true, some of the worst families with which I have had to deal, but they are typical of many.

The points illustrated may be summarised as follows. In a rural area many undoubtedly defective families are able to obtain a living and bring up a family —after a fashion; on the other hand, they may collapse entirely and drift into the workhouse with their families. The home conditions are frequently very bad and the children badly neglected. Children are produced in unlimited numbers apart from any prospect that the parents will be able to support them. Illegitimacy is a frequent occurrence in such families. Sometimes more serious offences may be committed as the result of mental defect. It will be seen that in some families all the children are imbecile or feeble-minded, in others only a larger or smaller proportion, though the rest are frequently subnormal.

Summary and Conclusion.

The present investigation has shown that, in the rural area examined, there exists among the school population a very high proportion of mentally defective children. The number so ascertained amounted to 3 per cent. of the school population under review, and of this percentage 0·5 per cent. were classified as imbeciles, and 2·5 per cent. as feeble-minded. We also showed reason for thinking that the actual percentage found fell short of the real number present, and that this number was probably somewhere in the neighbourhood of 4 per cent., or even higher. We explained the greater prevalence of mental defect in the rural area investigated, as compared with the usual numbers given for towns, by the lower level of intelligence required for more or less complete self-support in the simpler environment of the country.

By a consideration of typical families we showed that the mentally defective children were in most cases the offspring of generally degenerate stocks, the members of which were incapable of performing in any adequate way the duties and responsibilities of citizenship, but who were not incapable of earning a living of some sort in a rural environment. We thus obtained a picture of the kind of adult into which the mentally defective child was likely to develop.

I am indebted to Dr. C. E. Tangye, county medical officer of Wiltshire, for his permission to publish this report, and also for his advice in its preparation. My thanks are due to Dr. R. C. Monnington, of Salisbury, both for his assistance in the writing of the report and for his constant help and guidance during the whole time that the work on which it is based has been in progress. In addition, I should like to express my gratitude to those numerous teachers who have given me help in the investigations of individual children.

BLINDNESS AND OTHER OCULAR DEFECTS DUE TO NASAL DISEASE.

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THE following cases illustrate how blindness and other ocular lesions may be produced by inflammatory conditions in the nose. In all but the most recent text-books little emphasis is placed on the frequency with which nasal disease may be the cause of ocular defects. One cannot refrain from the reflection that in the not distant past many patients were allowed to lose their sight for want of a timely operation on the nasal sinuses.

Of 600 cases of orbital inflammation Hirchfield found 400 due to sinus disease, and Holmes considers that 40 per cent. of ocular lesions originate in the nose. These figures are not surprising when one considers that, save on its external aspect, the orbit is surrounded by the nasal sinuses which are constantly exposed to infective processes. Dimness of vision, congestion of the conjunctiva, enlargement of the caruncle, œdema of the eyelids, corneal ulcers, iritis, choroiditis, orbital cellulitis, tearing and other lacrymal affections, and optic neuritis may be mentioned among the eye conditions that may be due to nasal disease.

CASE 1.—Woman, aged 31, sent to the Throat Hospital, December, 1917, by Dr. Stroud Hosford, who reported vitreous effusion and opacities. General œdema and turbidity each retina, suggesting septic absorption. There was aching round the left eye for several months, misty vision at times, and some nasal catarrh. The middle turbinates were large; these were removed and some ethmoid cells opened. No pus was seen. Improvement in condition was rapid.

CASE 2.—Woman aged 29. Consulted me in 1919 for slight deafness and pain in the ears. There was a history of some post-nasal catarrh. She had choroiditis in both eyes for four years; at intervals crops of spots appeared on the fundus, some of them becoming permanent, so that by this time she was nearly blind in the left eye. The Wassermann test had been done four times, always negative. No hope of saving the sight was given her either in London or New York, and she had resigned herself to eventual blindness and devoted her time to learning Braille. In spite of the nose appearing normal, but taking into consideration the post-nasal catarrh, the occipital headache, the pain in the ears, and the deep-seated aching behind the eyes, I determined to explore the ethmoid and sphenoidal cavities. The ethmoid on both sides was found diseased, soft, and easily broken down, evidently the seat of a chronic inflammation. The sphenoidal sinuses were opened, but no pus was seen. With the exception of a temporary crop of spots on the right fundus a few weeks after the operation she has had no further eye trouble, and the headache and aching at the back of the eyes have disappeared.

CASE 3.—Man aged 50. In November, 1917, had antra opened and polypi removed. In February, 1922, when in the country, the left eye became red and swollen, and he was treated for erysipelas. When the swelling subsided in a week's time he noticed he was blind in the affected eye. Went to Westminster Ophthalmic. Report: optic disc pale, proptosis, slight conjunctivitis. March 14th: Referred to Golden-square. Eye normal externally, save for slight proptosis; unable to distinguish light from darkness. Operation same day. Ethmoid exposed by external incision. Large hole ¼ inch in diameter found in the os planum, but no pus seen. The ethmoid was cleared out and the sphenoidal sinus opened. No recovery of sight occurred. This case is cited to illustrate with what rapidity the sight may be permanently destroyed—that is, not more than three weeks.

CASE 4.—Woman aged 27. Sent to me in 1916 by Mr. Kenneth Campbell. He reported optic neuritis in each eye. There was a history of influenza two months previously, and for six weeks she complained of pain in the ear, at the back of the eyes, and across the bridge of the nose. On Feb. 26th, the day of the operation, she could only distinguish between light and darkness. The right disc was indistinct and pale; the left showed marked papillitis Elevation 1½ D. Beyond a slight deviation of the septum high up the nose appeared normal. The middle turbinates were not enlarged, and no pus was seen. In order to give more room in a narrow nose the septum was resected; it was thicker and more deviated than it appeared, and its removal allowed one to see the posterior ethmoid region, which was of a uniform dark plum colour. This was found to be almost as soft as butter. No pus was seen. The following day she could see quite well, and in four weeks' time Mr. Campbell reported vision 6/6 in each eye. The sphenoidal sinuses were opened, but appeared healthy. The almost immediate return of vision indicates that the condition was merely due to œdema or pressure on the nerve in the optic foramen.

Nasal Disease in Relation to Optic Neuritis.

Optic neuritis is undoubtedly the most interesting type of eye case that the nasal surgeon has to deal with, whether considered from its direful effect on vision or the dramatic swiftness with which certain cases of blindness are not infrequently restored to sight. In 1892 Caldwell reported a case due to sphenoidal disease, and Krause reported three cases in 1895. Some years later StClair Thomson reported a similar case. It was not until 1912, however, that Onodi, by his classic work on the nasal sinuses, focused attention on the subject. He demonstrated the varying and intimate relations of the optic nerve and nasal cavities, particularly the frequency with which the posterior ethmoidal cell enters into the formation of the optic canal. When this occurs the intervening bone is sometimes as thin and transparent as tissue paper; even this may be absent, so that the sheath of the nerve lies in direct contact with the lining membrane of the sinus. It must not be forgotten that the veins of the nose communicate directly with those of the dura and orbit.

The few post-mortems that have taken place show that the path of infection is by direct continuity of tissue—that is, there is a periostitis and an osteitis, the inflammation spreading thus to the sheath of the nerve. Infection may also occur by way of the veins and lymphatics. In a case of sphenoidal empyema Ortman found that diplococci extended through the periosteum and bone to the dura, and Hajek, in a case of ethmoiditis and meningitis, traced streptococci in the veins which extend from the ethmoid to the dura. One feels that as our knowledge increases many cases formerly labelled as toxic will be found to be due to a more definite pathological entity. Many cases of optic neuritis have now been reported in which nothing abnormal could be detected in the nose, yet on operating on the apparently sound ethmoid it is found to be diseased. This is due to a rarefying osteitis which softens and disintegrates its delicate walls without the formation of pus. Whether this is merely produced by a chronic congestion or is helped by some specific infective organism it is difficult to say, but there is no doubt that it frequently follows a severe cold or an attack of influenza. It would appear that this congestive process has a more penetrating action than that associated with pus.

The nasal surgeon in dealing with optic neuritis must bear in mind other factors which may be the cause of the disease. Syphilis, disseminated sclerosis, tobacco, alcohol, intracranial tumours, and toxæmic conditions, whether due to teeth, tonsils, or intestines, must be carefully investigated. The usual history is that some weeks after an attack of influenza or severe cold there is loss of sight generally in one eye, accompanied by deep-seated pain behind the orbit, occipital headache and perhaps pain in the ears, the eyeballs may be tender on pressure or their movement may be painful, and there may be a history of post-nasal dropping. These symptoms are of the greatest significance and help in diagnosis. Externally the eye is of normal appearance, and sometimes in the early stages nothing abnormal can be seen in the fundus. Characteristic signs, however, soon appear with papillitis and dilated retinal veins.

Permanent blindness may take place in two or three weeks. On the other hand, recovery has occurred after the lapse of several months.

Practical Conclusions.

A skiagram should always be taken. It may reveal an exostosis, a pituitary tumour, or other intracranial disease. It is not reliable or of much help where the sphenoid or ethmoid is concerned, although White, of Boston, says seven out of a series of 20 cases gave a positive photograph. It is well to remember that a sinusitis may be associated with an optic neuritis without having any causal relation (Onodi).

Where there is obvious nasal disease the duty of the surgeon is clear and the sinuses must be explored and laid open, but there is the type of case where no abnormality can be seen in the nose. Nevertheless, in these cases, every other cause of optic neuritis having been as far as possible excluded, there should be no hesitation or undue delay in exploring the ethmoid and opening the sphenoidal sinuses. The danger of doing so is negligible, and should not be considered in view of the gravity of the case. It is the only certain method of finding out the condition of these parts. In a narrow nose I advocate submucous resection of the septum, whether deviated or not. The extra room thus obtained will ensure a better view and enable one to carry out a more complete and satisfactory operation.

EARLY PERICARDOTOMY IN THE TREATMENT OF PERICARDITIS

SECONDARY TO OSTEOMYELITIS OF BONE.

By R. BROOKE, M.R.C.S. ENG.,
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PERICARDOTOMY for purulent pericarditis is at present a not infrequent procedure, and with the improvement of modern operative technique will be resorted to more often in future. The mortality from the operation is of necessity very high, so that it is undertaken only as a life-saving measure. The number of recoveries is much greater when the pericarditis occurs in the course of pneumonia or rheumatic fever than when it follows osteomyelitis of bone, the reason not being far to seek, for the latter condition is one manifestation only of a general pyæmia, and metastatic abscesses of the heart muscle itself usually coexist.

Thirty-six cases of pyopericarditis secondary to osteomyelitis of bone have been recorded in which drainage of the pericardium was performed. Recovery after operation took place in two instances only. A few of these cases are tabulated.

Cases Illustrating Importance of Early Operation.

The explanation of this high mortality probably lies in the delay in operative interference. For example, in 20 of the 36 cases pericardotomy was performed three to four or even ten days after fluid in the pericardium had been definitely diagnosed clinically, both by signs and symptoms, and by aspiration.

A good illustration of this is to be seen in the case of G. H. (No. 6 in table). The child was admitted into hospital with an acute osteomyelitis of the left femur of seven days' duration. Immediate operation was performed, and the whole of the shaft of the bone opened up and drained. Eight days after operation the boy showed no sign of improvement, and physical examination of the chest revealed the presence of a pericardial effusion, which was tapped. Turbid serum was drawn off, but at the end of 18 hours no micro-organisms were grown from it. Ten days later the pericardium was again tapped. This time pus was drawn off which, on microscopical examination, revealed the presence of large numbers of *Staphylococcus aureus*. Pericardotomy followed, with death 24 hours later. At the post-mortem examination a pericardium full of pus was found, with a small abscess in the myocardium which had ruptured into the pericardial sac. No other pyæmic foci were present.

The other examples are all similar, in that pericardotomy was delayed until needling of the pericardium revealed a purulent change in the pericardial fluid.

Name.	Duration and site of bone disease.	Length of time after onset before heart lesion.	Date of operation and description of findings.
1. Emma G., aged 14.	Ilium. 7 days.	12 days.	12th day: Pus. *Staph. aureus.* Death.
2. Cecil C., aged 9.	Femur. 2 days.	5 days.	5th day: Pus. *Staph. aureus.* Death.
3. Female.	Tibia. A few weeks.	Asp. twice. Last 5 days before Pr. Fluid sterile.	5 days after asp. Pus + +. No microscopical examination.
4. Female, aged 6.	Rib. Metatarsal. Ill six weeks.	Pm. Asp. 8 days and 4 days after admis. Fluid sterile.	Pr. 10 days after admis. Pus + +. Death.
5. Child, aged 7.	Tibia. Not stated.	Signs of effusion 6th day. 8 days after this pm. tapped. Fluid sterile.	Tapped 10 days later. + + pus. Pr. Death.
6. G. H., aged 11.	Femur. 1 week.	8 days later pm. tapped. Fluid sterile.	18 days later tapped. Pus + +. Pr. third. *Staph. aureus.* Death.

Asp. = Aspiration. Pr. = Pericardotomy.
Pm. = Pericardium.

Turning now to the two records where recovery ensued.

The first occurred in a lad aged 11. Henry P. was admitted into hospital with a two days' history of malaise and fever, with pain and tenderness over the right tibia. Immediate operation was performed, and the shaft of the tibia opened and drained. Eight days later the patient's condition was much the same as on admission, temperature 101° F., pulse 110–120. Physical examination of the chest revealed for the first time the presence of a pericardial rub situated at the base of the heart at the third left costo-sternal junction. The following day the rub had altered in position and character. It was now heard nearer the apex of the heart opposite the costo-sternal junction of the fourth left rib and only faintly. On the third day it had disappeared altogether and there were definite signs of fluid in the pericardium. On the twelfth day after admission the boy's condition was still serious, and the pericardial dullness extended half an inch to the right of the sternum, and to the left as far as the anterior axillary fold. The pericardium was tapped and slightly turbid fluid drawn off. This was thought to contain pus, so that immediate pericardotomy followed. Subsequent bacteriological examination of the fluid demonstrated the surprising fact that it was sterile. Twelve hours afterwards the wound was discharging pus containing a rich growth of *Staphylococcus aureus*. Subsequently, both pulse and temperature subsided rapidly and uneventful recovery took place. At the end of three months the boy was discharged to a convalescent home with the wound healed, and capable of doing a fair amount of active exercise. No signs of adherent pericardium were present.

The second recovery occurred in a boy, George H., aged 12, who was admitted to Guy's Hospital with 24 hours' history of pain in the left calf. On examination marked tenderness was found on deep pressure over the lower end of the left fibula, with swelling, heat, and œdema of the leg. Osteomyelitis of the left fibula was diagnosed, and immediate operation performed. Ten days afterwards he developed a pyæmic abscess in the shaft of the left tibia, which was drained but did badly; so that a Gritti-Stokes amputation was necessary on the fourteenth day. On the twenty-first day a metastatic abscess appeared in the upper end of the shaft of the left humerus. Seven days later a distinct rub was heard over the base of the heart, which disappeared six hours later. Meanwhile, the limits of cardiac dullness were extending and signs of pericardial fluid were now well marked. Twelve hours later the pericardium was needled and slightly turbid fluid evacuated, which on subsequent microscopical examination proved to be sterile. At the time the fluid was thought to be infected and pericardotomy was performed, a rubber drainage-tube being left in situ. Four hours after operation the fluid draining from the tube was distinctly purulent, and when examined microscopically

Staphylococcus aureus was seen in large numbers. Recovery in this boy was uneventful, and he is now walking about the ward. There are no obvious signs or symptoms of adherent pericardium.

In both these cases it will be noticed that the primary disease of bone was operated on at a comparatively early stage, and the pericardium drained before the effusion had become purulent. It is a matter for serious consideration, from this experience, whether it is advisable to perform early pericardotomy in cases of bone disease before the effusion has become purulent. The evidence seems all in favour of so doing.

Danger of Delayed Operation.

In the first place, pericardial effusions occurring during the course of osteomyelitis, if not purulent in the early stages, almost invariably become so later on, for, being pyæmic in origin, there are usually coexisting abscesses in the heart muscle. Besides, the danger of the operation is much less if done early, for the general resistance of the patient is then altogether higher. Further, the mechanical interference with the heart's action caused by the fluid will be removed, and hence the heart and circulation will be in a better condition to deal with the foci of infection. If, on the other hand, the fluid is allowed to remain until it becomes purulent, the outer layers of the heart muscle, bathed in pus, will lose their vitality, with great functional impairment of the whole organ.

Blind needling of the pericardium in more than one case has led to puncture of the heart itself, a dangerous accident; what is more, it is almost impossible to drain a pericardium efficiently by needling, because the bulk of the fluid lies behind the heart in the oblique sinus and is difficult to get at. The heart is thus pushed forward and is directly in the way of the exploring needle. Finally, if the pericardium is drained before pus forms, adherent pericardium is a less likely sequel.

In conclusion, the successful treatment of purulent pericarditis depends first of all upon the early diagnosis and treatment of the bone lesion. If the bone is efficiently drained at an early stage in the disease this complication can often be obviated. On the other hand, if the patient is left too long before active intervention is resorted to, pus may make its appearance in the pericardium at a very early date. There is no definite index as to how long it takes for a pericardial effusion to become purulent. It is very variable and depends upon a variety of factors. In every case of osteomyelitis a sharp look-out should be kept for the appearance of a suction sound at the base of the heart. When it is quite definitely present the heart should be examined at least every six hours, for the rub may change its position and fluid appear quite rapidly. If fluid is present recourse may be had to needling, but as a diagnostic measure rather than as a method of treatment. If fluid is withdrawn then the suggestion is that imr pericardotomy should be performed.

I am indebted to Sir Alfred Fripp for hi permission to publish these cases.

THE TREATMENT OF EPILEPSY WI DIALACE

BY SIDNEY H. HALL EDIN.

IN the treatment of epil the me
important factors is the early r ender
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particularly in the psychical
matter shortly, these prodro
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the daily care of epileptics can, l
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measures to ward off an attack.

epilepsy on a large scale the first principles appear to be a careful dietary and regimen coupled with the treatment of any concomitant organic disease. The physiological and therapeutic effects of bromides are well known. All practitioners, however, find amongst their cases of epilepsy what are termed "bromide failures," usually the class which fills special institutions and colonies.

No one of any experience would think of passing an opinion on the value of any remedy for epilepsy until such remedy had been tried for at least three months. In the cases on which I base the remarks to follow the period of observation has been over six months.

Nature, Dosage, and Effects of Dialacetin.

The drug on which the following reports are based is known as dialacetin, and is stated to be a combination of dial (well known as a most useful hypnotic) with allyl-paracetamino-phenol, the latter element in the combination having analgesic and antipyretic properties. Prof. Cushny, in his "Text-book of Pharmacology and Therapeutics," awards dialacetin a high place in the treatment of epilepsy, stating, inter alia, that it is preferable to luminal. Each tablet contains 1½ gr. of the former and 4 gr. of the latter constituent. It is well to commence with a small dose—say, half a tablet twice daily—and to increase this slowly until the maximum dose has been ascertained. The tablets disintegrate readily in water and their taste is by no means unpleasant. The only other caution to be issued is that if one desires to avert an increase in the number or intensity of the fits the use of any drug which may have been given before must not be stopped, but the dose lessened gradually and small doses of dialacetin given in addition. The dosage of dialacetin is then gradually increased and that of the other preparation reduced until in about three to five days dialacetin may be given alone in such doses as are found to be needed. The greatest success with this preparation is comparable with that attained by most other anti-epileptic remedies—that is, in cases where the seizures occur in cycles or bouts with a fairly long interval between each series of attacks. Here it is fairly safe to anticipate satisfactory results. The caution mentioned earlier to study the psychical state of the patient and to increase the dose slightly when a cycle is imminent well repays attention. Only one case has complained of a feeling of drowsiness after the use of this drug. In all other cases a pleasant psychical change was noted, the patient appearing more cheery and optimistic, in complete contrast to bromide cases. The drug is well tolerated even when taken over a long period. There have been no cases of skin eruption during its use. Sleep is almost always refreshing, and even those patients who are subject to nightmare state that their sleep is undisturbed.

One would indeed b to claim that dialacetin
would *cure* epilepsy; which will accomplish
this has yet to be fou y experience has been
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in violence cy and, though it is
ps early to spe d mental deteriora-
in such cases, I ident that this will
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some twitchings. These attacks were very alarming and left him very weak. Several sedative preparations, coupled with "suggestive" treatment, were tried without much effect, but with dialacetin the success was complete and he has had no recurrence for about six weeks. The second case was very similar, except that the child here was 3 years old and only cried herself into a fit when she was thwarted or hurt. She also gradually got bluer and bluer in the face and then became unconscious, frequently losing control of the bladder during the seizure. The case occurred shortly after that described above, and I did not try anything but dialacetin, which proved successful almost at once. The pathology of this condition is inexplicable, but most physicians will have met with such cases at one time or another.

I intend to try this preparation in other spasmodic nerve affections of children such as laryngismus stridulus and tetany, where I think it should prove of great value.

Fulham, S.W.

TRAUMATIC GANGRENE OF THE FOOT

COMPLICATING A FRACTURED FIBULA.

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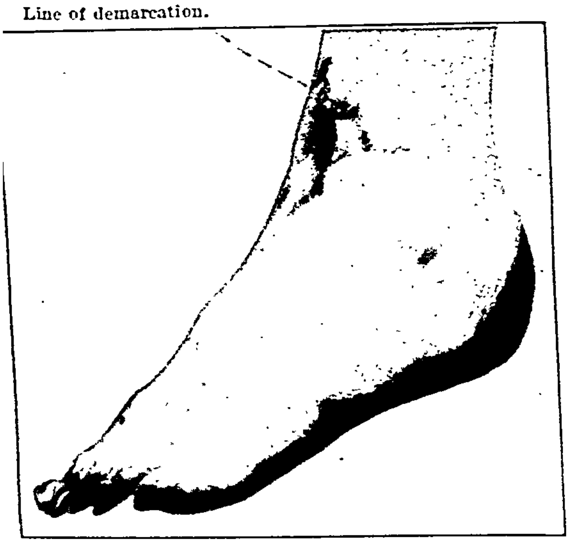
FRACTURES of the fibula per se are generally associated with little displacement and are seldom compound, particularly in the upper third of the bone. Involvement of the external popliteal nerve is the only complication of any severity described, and although this may result from the initial trauma, it is usually a later callus involvement of the nerve. Injury to the tibial vessels is of sufficient rarity to merit a description of this case.

FIG. 1.



The patient was a country labourer aged 36. "Never a day's illness in his life." Whilst cycling on April 5th, 1924, he was run down by a motor-car and sustained an injury to the left leg, immediately below the knee. He was admitted to the Faversham Cottage Hospital under Dr. A. Kennedy, with considerable bleeding from a punctured wound in the upper third of the leg. The bleeding was so profuse that it was thought that a compound fracture must be present with a large wound; examination, however, revealed only a tiny punctured wound over the junction of the upper and middle third of the left fibula. There was no sign of fracture and a firm dressing was applied to control the hæmorrhage. The following day the temperature was 101° F., and the limb much swollen.

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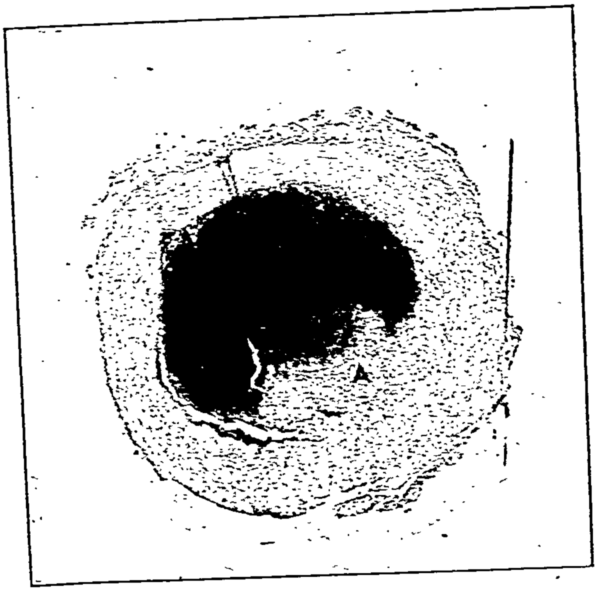
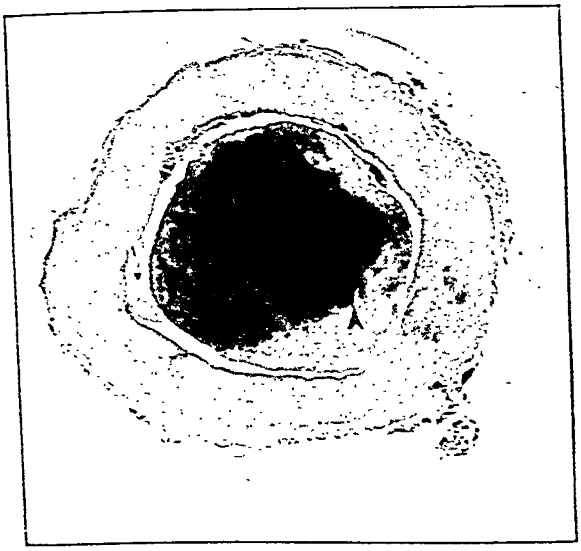
Condition on Admission.—The patient was admitted to Middlesex Hospital on April 20th under Mr. Sampson Handley. He seemed very ill, temperature 103°, pulse 120; the gangrene, however, was definitely of the "dry variety," and strong pulsation was present in the left popliteal artery. On the 26th he suddenly developed a right femoral thrombosis, which quickly resolved. These symptoms suggested the possibility of endocarditis or septicæmia, but a blood culture remained negative, and it appeared to be a postural condition. On May 1st Mr. Handley performed peri-arterial injection of the vaso-motor nerves on the left femoral artery in Hunter's canal, but this had no influence on the gangrene.

FIG. 2.



Section of posterior tibial artery showing organisation of thrombus, commencing at A.

FIG. 3.



Section of anterior tibial artery showing organisation of thrombus commencing at A.

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Staphylococcus aureus was seen in large numbers. Recovery in this boy was uneventful, and he is now walking about the ward. There are no obvious signs or symptoms of adherent pericardium.

In both these cases it will be noticed that the primary disease of bone was operated on at a comparatively early stage, and the pericardium drained before the effusion had become purulent. It is a matter for serious consideration, from this experience, whether it is advisable to perform early pericardotomy in cases of bone disease before the effusion has become purulent. The evidence seems all in favour of so doing.

Danger of Delayed Operation.

In the first place, pericardial effusions occurring during the course of osteomyelitis, if not purulent in the early stages, almost invariably become so later on, for, being pyæmic in origin, there are usually coexisting abscesses in the heart muscle. Besides, the danger of the operation is much less if done early, for the general resistance of the patient is then altogether higher. Further, the mechanical interference with the heart's action caused by the fluid will be removed, and hence the heart and circulation will be in a better condition to deal with the foci of infection. If, on the other hand, the fluid is allowed to remain until it becomes purulent, the outer layers of the heart muscle, bathed in pus, will lose their vitality, with great functional impairment of the whole organ.

Blind needling of the pericardium in more than one case has led to puncture of the heart itself, a dangerous accident; what is more, it is almost impossible to drain a pericardium efficiently by needling, because the bulk of the fluid lies behind the heart in the oblique sinus and is difficult to get at. The heart is thus pushed forward and is directly in the way of the exploring needle. Finally, if the pericardium is drained before pus forms, adherent pericardium is a less likely sequel.

In conclusion, the successful treatment of purulent pericarditis depends first of all upon the early diagnosis and treatment of the bone lesion. If the bone is efficiently drained at an early stage in the disease this complication can often be obviated. On the other hand, if the patient is left too long before active intervention is resorted to, pus may make its appearance in the pericardium at a very early date. There is no definite index as to how long it takes for a pericardial effusion to become purulent. It is very variable and depends upon a variety of factors. In every case of osteomyelitis a sharp look-out should be kept for the appearance of a suction sound at the base of the heart. When it is quite definitely present the heart should be examined at least every six hours, for the rub may change its position and fluid appear quite rapidly. If fluid is present recourse may be had to needling, but as a diagnostic measure rather than as a method of treatment. If fluid is withdrawn then the suggestion is that immediate pericardotomy should be performed.

I am indebted to Sir Alfred Fripp for his kind permission to publish these cases.

THE TREATMENT OF EPILEPSY WITH DIALACETIN.

BY SIDNEY H. HALL, M.D., C.M. EDIN.

IN the treatment of epilepsy one of the most important factors is the early recognition of prodromal signs. These have been recently considerably extended, particularly in the psychical sphere. Putting the matter shortly, these prodromal signs vary from alterations in mood and manner, from extreme depression and irritability to the heights of gaiety, optimism, and evanescent brilliance. Those who have the daily care of epileptics can, by a due and keen observance of these psychic variations, often take measures to ward off an attack. In the treatment of epilepsy on a large scale the first principles appear to be a careful dietary and regimen coupled with the treatment of any concomitant organic disease. The physiological and therapeutic effects of bromides are well known. All practitioners, however, find amongst their cases of epilepsy what are termed "bromide failures," usually the class which fills special institutions and colonies.

No one of any experience would think of passing an opinion on the value of any remedy for epilepsy until such remedy had been tried for at least three months. In the cases on which I base the remarks to follow the period of observation has been over six months.

Nature, Dosage, and Effects of Dialacetin.

The drug on which the following reports are based is known as dialacetin, and is stated to be a combination of dial (well known as a most useful hypnotic) with allyl-paracetamino-phenol, the latter element in the combination having analgesic and antipyretic properties. Prof. Cushny, in his "Text-book of Pharmacology and Therapeutics," awards dialacetin a high place in the treatment of epilepsy, stating, inter alia, that it is preferable to luminal. Each tablet contains $1\frac{1}{2}$ gr. of the former and 4 gr. of the latter constituent. It is well to commence with a small dose—say, half a tablet twice daily—and to increase this slowly until the maximum dose has been ascertained. The tablets disintegrate readily in water and their taste is by no means unpleasant. The only other caution to be issued is that if one desires to avert an increase in the number or intensity of the fits the use of any drug which may have been given before must not be stopped, but the dose lessened gradually and small doses of dialacetin given in addition. The dosage of dialacetin is then gradually increased and that of the other preparation reduced until in about three to five days dialacetin may be given alone in such doses as are found to be needed. The greatest success with this preparation is comparable with that attained by most other anti-epileptic remedies—that is, in cases where the seizures occur in cycles or bouts with a fairly long interval between each series of attacks. Here it is fairly safe to anticipate satisfactory results. The caution mentioned earlier to study the psychical state of the patient and to increase the dose slightly when a cycle is imminent well repays attention. Only one case has complained of a feeling of drowsiness after the use of this drug. In all other cases a pleasant psychical change was noted, the patient appearing more cheery and optimistic, in complete contrast to bromide cases. The drug is well tolerated even when taken over a long period. There have been no cases of skin eruption during its use. Sleep is almost always refreshing, and even those patients who are subject to nightmare state that their sleep is undisturbed.

One would indeed be foolish to claim that dialacetin would *cure* epilepsy; the drug which will accomplish this has yet to be found. But my experience has been that under its use major attacks have been both reduced in violence and frequency and, though it is perhaps early to speak of a lessened mental deterioration in such cases, I am fairly confident that this will be another result. Prima facie one is justified in anticipating this. The only class of case where the remedy named has been a little disappointing was where transient loss of consciousness was the chief or only manifestation; and my experience has always been that treatment of any kind is not helpful in these. My observations are based on the records of 52 cases, and in my opinion justify a much more extended trial of this remedy.

I have used dialacetin, though not in a great number of cases, in nervous manifestations in young children. Two of such cases are of interest. In the first a boy, aged 2 years, with a history of "convulsions" in infancy, there used to be definite convulsions every time he cried. He was a spoilt child, and when he got worked up to the crying point he used to hold his breath, become purple in the face, and then pass into a state of unconsciousness with some twitchings. These attacks were very alarming and left him very weak. Several sedative preparations, coupled with "suggestive" treatment, were tried without much effect, but with dialacetin the success was complete and he has had no recurrence for about six weeks. The second case was very similar, except that the child here was 3 years old and only cried herself into a fit when she was thwarted or hurt. She also gradually got bluer and bluer in the face and then became unconscious, frequently losing control of the bladder during the seizure. The case occurred shortly after that described above, and I did not try anything but dialacetin, which proved successful almost at once. The pathology of this condition is inexplicable, but most physicians will have met with such cases at one time or another.

I intend to try this preparation in other spasmodic nerve affections of children such as laryngismus stridulus and tetany, where I think it should prove of great value.

Fulham, S.W.

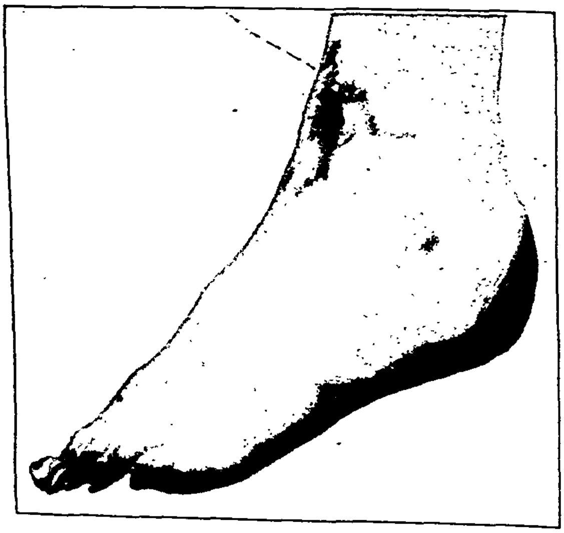
TRAUMATIC GANGRENE OF THE FOOT

COMPLICATING A FRACTURED FIBULA.

BY J. B. G. MUIR, M.B., B.S. LOND., F.R.C.S. ENG.,
SURGICAL REGISTRAR, MIDDLESEX HOSPITAL.

FRACTURES of the fibula per se are generally associated with little displacement and are seldom compound, particularly in the upper third of the bone. Involvement of the external popliteal nerve is the only complication of any severity described, and although this may result from the initial trauma, it is usually a later callus involvement of the nerve. Injury to the tibial vessels is of sufficient rarity to merit a description of this case.

FIG. 1.



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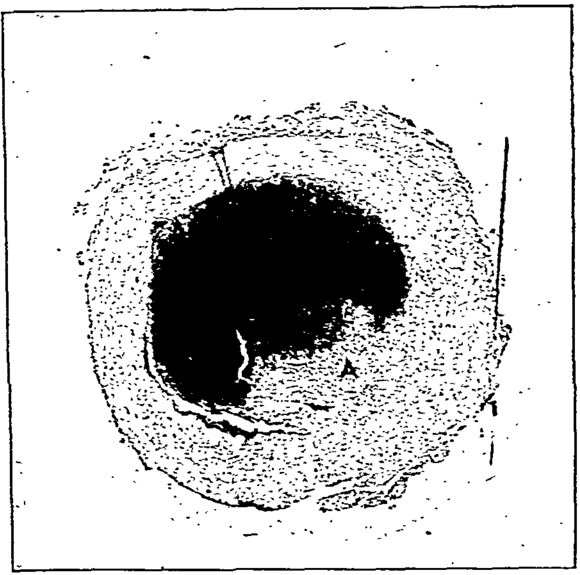

Section of posterior tibial artery showing organisation of thrombus, commencing at A.

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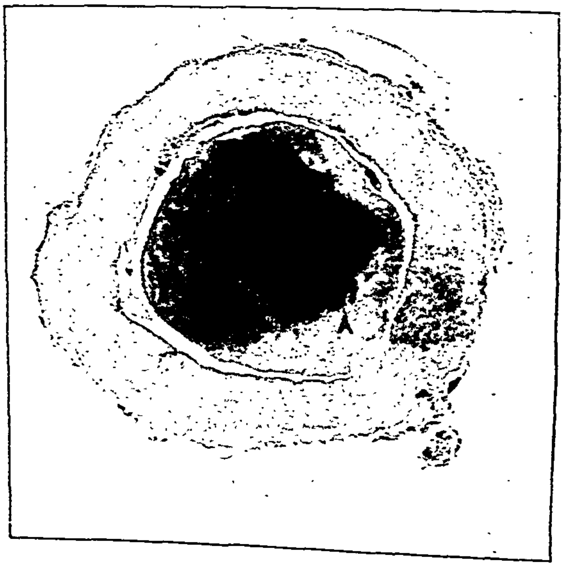

Section of anterior tibial artery showing organisation of thrombus, commencing at A.

On the 5th I amputated the left leg at the seat of election, using the equal lateral flap method. This low site was chosen because there appeared to be no organic arterial disease present, which would have influenced the site had the case been one of senile gangrene. During the operation I was surprised to see no bleeding from either the anterior or posterior tibial vessels, which contained partially organising thrombi, although free hæmorrhage occurred from the sural branches of the popliteal. The external popliteal nerve was undamaged. The stump healed by first intention, and patient made an uninterrupted recovery.

Pathological Considerations.

On carefully dissecting the amputated leg a localised, intramuscular extravasation of blood was found around the fracture. This had come from a wound in the first part of the posterior tibial artery, above the origin of the peroneal branch. The proximal part of the vessel contained organising clot which had obviously extended back to the division of the popliteal. At the seat of the fracture the anterior tibial was also injured. This lesion seemed to be more of a bruise which had caused rupture of the inner coat, and the proximal portion of the vessel contained clot. Section of each vessel (see Figs. 2 and 3) showed no arterial disease, the lumens of each containing organising thrombi. The line of demarcation occurring immediately over the ankle-joint would appear to mark the junction of the cutaneous and muscular zone nourished by the sural branches of the popliteal, with the free arterial anastomosis around the ankle-joint from the malleolar and calcaneal branches of the anterior and posterior tibial vessels. The upper third of the fibula is well-clothed and firmly fixed by muscular origins and ligaments, and relatively immobile, so that a spring-like movement of the upper fragment, which had returned to good position and alinement, wide enough to injure both tibial arteries, must be a rare phenomenon.

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Clinical and Laboratory Notes.

A NEW FORM OF SUTURE MATERIAL.

By Donald McIntyre, M.B. Glasg., F.R.C.S. Edin.,
ASSISTANT TO THE MUIRHEAD PROFESSOR OF OBSTETRICS AND GYNÆCOLOGY, UNIVERSITY OF GLASGOW.

The production of this material has resulted from dissatisfaction with the present suture material available for closing the uterine incision in Cæsarean section (classical operation). There appears to be a certain element of danger associated with the use of catgut. This results from its slippery surface producing a tendency to loosening of tension or actual unknotting, and from the danger of too early absorption.

On the other hand, unabsorbable material, such as silk, when employed of sufficient thickness to effect satisfactory closure of the wound in the wall of this powerful muscular organ, may lead to minor complications such as adhesions, sinuses, fistulæ, and vesical calculi. Furthermore, it has been shown that a coarse silk suture in the uterine wall may produce a defect in the scar at the site of the suture.

The new material consists of a combination of catgut and silk. The catgut is hardened to 20-day muscle duration, and forms the greater bulk of the suture. Two or more strands of very fine silk are incorporated in the surface. The silk on the surface makes the material easy to handle and eliminates slipping of the knot. The bulk of the suture is absorbed, but the fine strands of silk remain, and so variations in the rate of absorption of the catgut do not constitute a danger.

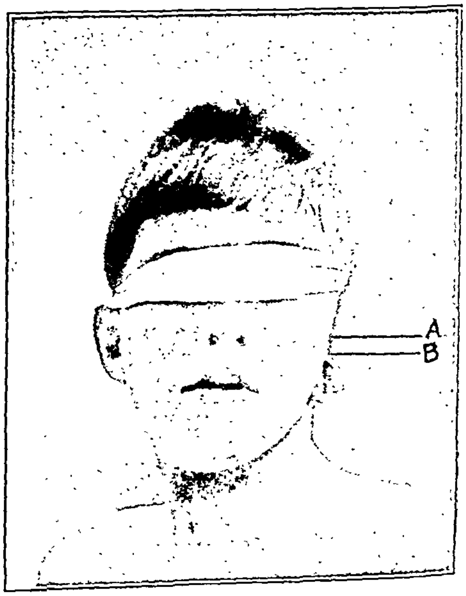
This suture material has been prepared at my suggestion by Messrs. G. F. Merson, Ltd., of Edinburgh. This firm, after a series of careful experiments in combining the two materials, is now able to supply a suture in which the strain when applied is distributed proportionately to the silk and the gut. The silk does not come adrift from the catgut and yet is confined to the surface, being only partially embedded. Messrs. Merson state that "the 'catgut silk-reinforced' may be had in hermetically sealed glass tubes of guaranteed sterility. The sterilising process is carried out during the various stages of manufacture, and after the strings have been tubed, in precisely the same detail as in the case of 'Merson's sterile catgut.' The cost naturally is higher than that of plain catgut, but not so much so as to prove any bar to free use in cases where the ligature is suitable."

The employment of this suture material was first suggested in a paper submitted to the Section of Obstetrics and Gynæcology of the Royal Society of Medicine on June 5th, 1924, when specimens of the material were demonstrated. While originally evolved in connexion with the operation of Cæsarean section, it is suggested that it might be employed with advantage in other surgical procedures.

DEVELOPMENT OF AURICLE ON SECOND BRANCHIAL CLEFT.

By Spencer Mort, M.S., M.D. Glasg., F.R.C.S., F.R.S. Edin.,
SURGICAL DIRECTOR, NORTH MIDDLESEX HOSPITAL; MEMBRE DE LA SOCIÉTÉ INTERNATIONALE DE CHIRURGIE; LATE ASSISTANT TO REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

In this case the photograph shows a remarkable example of extensive development of the external ear over the situation of the second gill cleft. The boy was sent to consult me by Dr. Frank Mort, of Middlesbrough, with reference to the deformity, as he was about to go to a public school and felt keenly his appearance. It will be noted that in addition to a malformed and displaced auricle there is a hemiatrophy of the left side of the face, and a paresis of the muscles supplied by the left facial nerve. Closer inspection reveals the presence of a dimple above the malformed auricle, representing the true internal ear, which was skinned over and acting efficiently as an organ of hearing (marked A on photograph). The pointer B indicates the situation of the facial nerve crossing after emerging from the stylo-mastoid foramen, and this in development was pressed on slightly by bands of connective tissue. The auricle itself was clover-leaf shaped. Two portions will be seen in the photograph; the third



portion was situated between the two and running horizontally backwards. The picture was taken immediately before operation on a dull day with faulty apparatus, and I was unable to secure a good lateral view.

At the operation I was assisted by Dr. A. W. Gregorson, and remedied the two defects of shape and position as far as possible. This was done by splitting the two anterior portions of the auricle and bringing between them the middle horizontal part, with adjustments and trimming to resemble the shape of the other ear; also by bringing down a flap of skin from the temporal region it was found possible to increase the size of the newly modelled ear, and pull it up to its proper situation. The operation itself was exceedingly troublesome and tedious, but remarkable recovery followed. The facial paralysis immediately improved, and in six days the patient was able to go home. Since then I have been informed that the ultimate result is one of very material æsthetic improvement. The affected ear is now smaller than the other, but in general appearance it seems as if it had been a normal ear, damaged by a slight accident, and the patient has no longer to endure the jibes of his school friends. With reference to this condition, I have not seen such a marked example published in any text-book.

Reviews and Notices of Books.

DOMICILIARY TREATMENT FOR PULMONARY TUBERCULOSIS.

Second edition. By F. RUFENACHT WALTERS, M.D., B.S., M.R.C.P. Lond., F.R.C.S. Eng., Medical Director, Crooksbury Sanatorium. London: Baillière, Tindall and Cox. 1924. Pp. 288. 7*s.* 6*d.*

THE first edition of this book was published as recently as 1921, and in his preface to this, the second, edition the author denies himself with rare modesty that self-praise which most authors bestow on themselves when they refer to the necessity for the early publication of a second edition. Modesty, as well as intimate and first-hand knowledge of his subject, is, indeed, one of the characteristics of this book, which is a positively encyclopædic collection of recent work on the treatment of pulmonary tuberculosis. The author has no reliable specific remedy to offer for every case, but, as he points out, it seems a pity "that we should not make a more intelligent use of the many excellent remedies and methods of treatment which we already possess." These remedies and methods of treatment he describes in his book, which is full of such profound truths as the following: "Half the tragedies in tuberculosis are caused by the absence of such a record (an accurate temperature record) or its disregard."

The alterations made in the second edition are at the beginning and end, a general review of the subject being given in an introductory chapter, and an additional chapter being added on the public and social relations of home treatment. We regret to differ from the author over his opinion that "consultants who take a special interest in the disease are fairly unanimous in their opinions as to its causation and treatment . . ." Would that they could be! But they still hold widely divergent views as to such important matters as the influence of heredity on the development of tuberculosis and the source of infection in adult life—the relative importance of endogenous and exogenous infection, and the correctness of the Andvord-Romer teaching that practically every case of pulmonary tuberculosis in adult life is due to infection in childhood. And as for treatment, auto-inoculation is anathema to some authorities and the therapeutic mainstay of others. By not committing himself to a defence of any of the extreme schools of thought, the author has provided as good a guide to the general practitioner as could be expected in our present state of half-knowledge of tuberculosis.

PHYSIOLOGICAL INCOMPATIBILITIES IN DENTAL SURGERY.

Vol. I.: Amalgams. By U. REINECKE, L.D.S. Edin. Cape Town: Townshend, Taylor and Snashall. 1923. Pp. 137. 10*s.* 6*d.*

Mr. Reinecke has written an interesting book from an unusual angle which challenges the long-accepted routine of conservative dentistry. His point of view may be summed up thus. The practice of filling teeth with materials which are chosen for their permanence and stability, regardless of the fact that physiologically they are entirely different from the dental tissue they replace, is wrong and may lead to various local and general disturbances. In this volume he limits his consideration to amalgam, which constitutes the vast majority of fillings. He contends that the metals of which the amalgams are composed may undergo dissociation in the mouth. The metallic ions may penetrate the devitalised dentine and come into contact with the protoplasm in the living dentine. This in turn will become devitalised by the toxic action of the metallic products and eventually lead to death of the pulp. Still further the gum, periodontal membrane, and bone may become damaged and even die as the result of long-continued metallic absorption. The staining of dentine by copper amalgam, which has hitherto been regarded as evidence of its penetration and power to sterilise infected dentine, so far from being an advantage, is, according to Mr. Reinecke, a grave defect. Its caustic action cannot be limited to bacteria in the dentine, but must eventually invade healthy tissue and cause its death. In filling teeth the aim of the dentist should not be the obturation of cavities by hard and unyielding material, but rather to replace the missing dental tissue by a material compatible with the teeth.

This point of view is worth consideration, although it might not be easy to find materials which are physiologically compatible and at the same time durable. It cannot be said, however, that Mr. Reinecke provides much direct evidence for his contentions. The fact that copper can be dissociated and evidently does undergo alteration in the mouth, that it possesses toxic properties, and that the tissues of the body under certain conditions can absorb metallic particles—these points are taken as sufficient evidence that copper amalgam used for filling teeth exerts a gradual toxic effect on the teeth, eventually extending to the gum and thence, maybe, to the body generally. Theoretically, all this is possible, yet the clinical evidence which the author adduces is susceptible of other and perhaps more reasonable explanation. Nevertheless, Mr. Reinecke has done good service in drawing attention to the possibility that in concentrating on the mechanical properties of filling materials we have overlooked defects arising from their incompatibility with the dental tissues.

MYOCARDITIS IN CHILDHOOD.

Myokarditis im Kindesalter. By Dr. MATTHEUS VISCHER. Berlin: S. Karger. 1924. Pp. 87. Gold marks 4·20.

IN this monograph the author has given the first half to a critical review of interstitial myocarditis in children with status thymo-lymphaticus, reported in the German literature, along with other recorded cases of interstitial myocarditis associated with myasthenia gravis, Basedow's disease, and polymyositis in children. The second half consists of an analysis of the post-mortem material at the Basle Pathological-Anatomical Institution over a period of six years. Among 783 post-mortem examinations present, which would have influenced the site had the case been one of senile gangrene. During the operation I was surprised to see no bleeding from either the anterior or posterior tibial vessels, which contained partially organising thrombi, although free hæmorrhage occurred from the sural branches of the popliteal. The external popliteal nerve was undamaged. The stump healed by first intention, and patient made an uninterrupted recovery.

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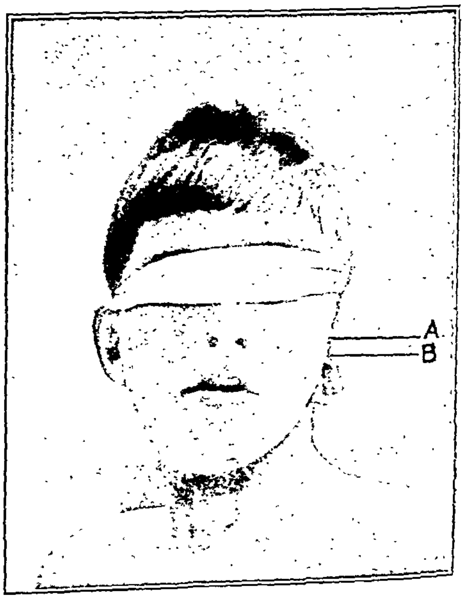
BY SPENCER MORT, M.S., M.D. GLASG., F.R.C.S., F.R.S. EDIN.,
SURGICAL DIRECTOR, NORTH MIDDLESEX HOSPITAL; MEMBRE DE LA SOCIÉTÉ INTERNATIONALE DE CHIRURGIE; LATE ASSISTANT TO REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

IN this case the photograph shows a remarkable example of extensive development of the external ear over the situation of the second gill cleft. The boy was sent to consult me by Dr. Frank Mort, of Middlesbrough, with reference to the deformity, as he was about to go to a public school and felt keenly his appearance. It will be noted that in addition to a malformed and displaced auricle there is a hemiatrophy of the left side of the face, and a paresis of the muscles supplied by the left facial nerve. Closer inspection reveals the presence of a dimple above the malformed auricle, representing the true internal ear, which was skinned over and acting efficiently as an organ of hearing (marked A on photograph). The pointer B indicates the situation of the facial nerve crossing after emerging from the stylo-mastoid foramen, and this in development was pressed on slightly by bands of connective tissue. The auricle itself was clover-leaf shaped. Two portions will be seen in the photograph; the third



JOURNALS.

BRITISH JOURNAL OF SURGERY.—The July issue contains Sir D'Arcy Power's XIII. Eponym—Syme's amputation.—H. P. Winsbury White discusses the radiographic characteristics of urinary calculi, pointing out that calcium oxalate and calcium phosphate stones show best, the others showing clearly but not so distinctly. The only stones that may fail to give a shadow are those consisting of uric acid and ammonium urate in the bladder.—Kenneth Mackenzie reports a case of a large ventral hernia in the left lower quadrant, which was cured by transplanting the left tensor fasciæ femoris muscle to fill the gap. —Luke Koken Ito describes his experimental results upon the nutrition of articular cartilage and its method of repair. He concludes that damaged articular cartilage is replaced by granulation, which passing through the stages of fibrous tissue and fibro-cartilage becomes true cartilage.—Sir Hugh Rigby contributes a paper on external duodenal fistulæ and discusses the treatment. His results show that the prognosis in these cases is infinitely better than is generally supposed.—Prof. C. C. Choyce analyses 59 reported cases of traumatic dislocation of the hip in childhood, and draws attention to the fact that some of these cases are followed within one or two years by pseudo-coxalgia.—J. P. Buckley discusses the ætiology of the femoral hernial sac, believing that there is no sufficient proof that the pre-formed peritoneal sac is of congenital origin.—A preliminary report, with several excellent colour drawings, is made by A. Tudor Edwards on the use of the thoracoscope in surgery of the chest. He explains its technique and describes the normal and some pathological appearances.—J. Renfrew White describes two bone diseases, one a man of 26 with multiple exostoses and a similar case in a boy of 7 years; in addition he has a case of achondroplasia.—Two simple methods of exposing the humerus and the femur are described by A. K. Henry, which seem to give an easier access to the shafts of these two bones than is attained by other operations.—J. S. B. Stopford, in reporting a case of gangrene of the leg due to obliteration of the popliteal artery, shows how important is the site of the occlusion. Ligature above the origin of superior articular arteries is quite safe, whereas ligature near the inferior articular arteries demands such a complicated system of anastomosis to be opened up that gangrene frequently follows.—T. Twistington Higgins and E. I. Lloyd discuss the subject of mesenteric cysts with reports of two cases.—S. C. Dyke and B. C. Maybury record the results of their experiments on rabbits in attempting to produce an ascending renal infection. They conclude that the production of cystitis fails to give rise to an infection in the kidney, but that infection of the ureter ascended by direct spread along the epithelium.—R. M. Handfield-Jones's Hunterian lecture on retroperitoneal cysts is reported, in which he discusses their ætiology, symptoms, and treatment.—C. P. G. Wakeley publishes his Arris and Gale lecture on some actions of radiations on living tissues.—C. Max Page's Hunterian lecture deals with the surgical treatment of osteo-arthritis. He divides treatment under four headings: (1) Excision of the joint: (2) arthroplasty: (3) erosion of the joint: and (4) synovectomy, and takes the more commonly affected joints in turn and discusses the results.—Hamilton Bailey and G. P. B. Huddy discuss the treatment of extravasation of urine with especial reference to peri-urethral abscess.—K. W. Montsarrat describes a method of extra-peritoneal approach to the ureter through a mid-line sub-umbilical incision and displacement of the peritoneal sac.—The following rare or obscure cases are put on record. (1) Hugh Reid: A Case of Calculus in the Pelvis of an Ectopic Kidney. (2) C. Hamilton Whiteford: An Abnormal First Rib Producing a Supraclavicular Tumour. (3) W. E. Tanner: An Acute Colic Intussusception in a child aged 2½ years.

TROPICAL DISEASES BULLETIN. Sanitation Supplement No. 2, June 30th, 1924.—We have previously commented upon the high scientific value of the Sanitation Supplements issued by the *Bulletin* under the able editorship of Lieut.-Colonel W. Wesley Clemesha, and the present number, which contains nearly 100 pages, maintains a high standard. The information is divided into sections, such as disease prevention, water, food, conservancy, small-pox vaccination, disinfection, infant welfare, reports and statistics, notices and reviews. The supplement is well illustrated with diagrams and photographs, amongst which we note some remarkable pictures taken in the Dutch East Indies of the effect of neosalvarsan upon secondary yaws.

Reports and Analytical Records.

(1) OUABAINE ARNAUD; (2) QUINICARDINE; (3) DIGITALINE.

(From the Laboratoire Nativelle.)

(MESSRS. WILCOX, JOZEAU AND CO., 15, GREAT ST. ANDREW-STREET, LONDON, W.C. 2.)

WE have received from this firm samples of Ouabaine Arnaud put up in different forms and in different strengths, the receptacles bearing full instructions for application and dosage. Ouabaine is a glucoside of the same natural order as strophanthus, and has been described in many places as a substitute for digitalis, but for Ouabaine Arnaud ($C_{30}H_{46}O_{12}$) no such claim is made. The drug, it is suggested, does not replace digitalis preparations but rather completes their effect, much elaborate work having been done to prove the pharmaco-dynamic action of ouabaine as affecting favourably the cardiac systole, while digitalis prolongs the diastole. The drug has the merit also, if the instructions are followed, of being a safe remedy. It is supplied in different forms, as a standard solution 1 in 1000, as tablets of 1/6000 of a grain, and as ampoules of 1 or 2 c.cm. containing ½ mg. of the drug.

From the same laboratory we have received five different preparations of crystallised digitaline, a solution of 1 in 1000, two granular preparations, the granules containing 1/600 and 1/240 gr., and ampoules of different strengths for hypodermic use. Here also full directions are given on the receptacles with the recommended dosage.

We have also received a further sample of tablets of quinicardine, or compressed sulphate of quinidine.

TUBORG LAGER BEER AND TUBORG LIGHT LAGER.

(TUBORG BREWERIES, COPENHAGEN, DENMARK.)

These two beers were bottled at the well-known Danish Tuborg Brewery. When analysed the following results were obtained:—

	Tuborg lager.	Tuborg's light lager.
Specific gravity of wort before fermentation	1056·50°	1043·68°
Present specific gravity	1014·78°	1014·14°
Alcohol per cent. by volume ..	5·4	3·78
Extractives per cent. (total soluble matter)	5·58	4·80
Acidity per cent. as acetic acid ..	0·08	0·07
Original wort solids fermented (per cent.)	60·5	55·2
Fermentable sugars still present (per cent.)	0·13	1·06
Preservatives (salicylic acid and sulphites)	nil	nil

Both these beers, which were in crown-corked bottles of half a pint capacity, were brilliant and free from any sediment. The palate possesses that softness and delicacy so characteristic of the finer kinds of lager beer. The strong hop flavour associated with our English beer is absent. The lager, which is brewed at a slightly higher gravity than Guinness stout or Bass ale, is fermented to a greater extent than the light lager. The absence of preservatives, the low acidity, and general appearance of the two beers made on the new-born and children up to the age of 15, 27 instances of interstitial infiltration of the heart muscle were found. There were 32 cases of status thymo-lymphaticus, and four only of these showed post-mortem evidences of myocarditis. Myocarditis was found in two with status lymphaticus. In all other cases the microscopic examination of the heart revealed nothing abnormal. The author concludes from these observations that myocarditis is not a result of a constitutional anomaly in these cases of status thymo-lymphaticus, and has only an accidental relationship with this disease. True cases of primary acute interstitial myocarditis are reported, and attention is drawn to the interesting clinical picture which they presented. There are no new facts bearing on the ætiology of this disease.

FUNDAMENTAL PRINCIPLES IN TREATMENT.

By HARRY CAMPBELL, M.D., B.S., F.R.C.P. Lond., Senior Physician, West End Hospital for Nervous Diseases; late Physician and Pathologist, North-West London Hospital. London: Baillière, Tindall and Cox. 1924. Pp. 477. 10*s.* 6*d.*

Dr. Campbell does not set out to give a systematic treatise on therapeutics, but provides an agreeable combination of criticism, comment, and advice, held together by a strong thread of common sense, and showing the good qualities conjured up by the phrase "an old-fashioned physician." His opening remarks, for example, on the mental and physical personality of the physician contain such shrewd advice as can only be the result of long experience; they avoid, on the one hand, the tendency to see in the sick person only a collection of test-tube reactions, and on the other, the disposition to forget the scientific aspects of medicine in the attempt to impress one's personality upon the patient. He defends empiricism and bases the use of drugs upon experience rather than upon an assumed knowledge of their physiological action and the morbid processes going on in the body, and whilst saying a good word for fads in strict moderation he points out the dangers of their general application. Perhaps the author deals too gently with our own deficiencies when he indicts the system of *lay* education as the cause of the prevalence of quackery (p. 67), for on the next page he cites the case of a lady who had been an invalid for many years, and had consulted doctor after doctor without any benefit, and yet permanently regained good health after a fortnight's treatment by a quack rubber. Failure in handling such an obviously neurotic patient must surely bear some relation to the fact that psycho-therapy, to which Dr. Campbell devotes six chapters, has no place in the medical curriculum. Practical chapters on housing, fresh air, clothing, exercise, and rest are followed by what is plainly the author's pet subject, for over a quarter of the book is given to the consideration of diet, the teeth, and mastication. A collection of therapeutic aphorisms concludes a book which is marked by an easy style and a wide range of interesting subject-matter.

SPIRITUAL HEALING.

A Discussion of the Religious Element in Physical Health. By the Rev. HAROLD ANSON, M.A. University of London Press. 1923. Pp. 211. 3*s.* 6*d.*

SPIRITUAL healing, constructive thought, practical psychology—all these forms of ascetical exercises are much to the fore nowadays, and this book gives us an account of what spiritual healing really is. As defined by the author on p. 79, it is this:—

> "Spiritual healing rests on the belief that all men are intended to develop towards a standard of perfection which is ultimately attainable, and that they cannot be said to be in perfect health until they have at ained that standard. It is not enough that they should be following their consciences, or that they should be happy and at ease in their present circumstances, or that they should conform to the average ideal of their class or nation. We believe that there is an unseen standard of perfection by which we must all be judged, which we ourselves have the power to evolve through coöperation with God as Spirit."

Again, in his first chapter Mr. Anson says:—

> "We should all probably agree that perfect health ought not merely to be concerned with the purely physical reactions towards life, but ought to aim at placing the person in complete harmony with the *whole* environment—spiritual, mental, and physical—in which he has to live."

He does not put forward spiritual healing as though it were a substitute for medicine or psychology, but claims that it is "rather that which makes the best use of all factors of cure in the proportion appropriate to each particular case." And so it comes about that for spiritual healing a knowledge of God (in so far as the finite can understand the infinite) is necessary, and as our minds and spirits can only express themselves through matter we must look upon matter as "the medium through which the Divine expresses itself."

These are difficult subjects, but Mr. Anson treats of them in a simple and reasonable fashion in his chapters on the Nature of God, Worship, God and the Material World, Man, Why we Call Jesus God, the Spirit, Mind and Body, and Sin. The rest of the book is made up of chapters upon Spiritual Healing in Practice, an Examination of "Christian Science," Auto-suggestion and Prayer, and Miracles. Mr. Anson does not desire that the Church should license special healers, a conclusion to which the Archbishop of Canterbury's Committee on the Ministry of Healing came in November last. Another point on which Mr. Anson insists is the necessity for spiritual directors being properly trained. The Prayer Book lays it down that if any person requires comfort or counsel he should go to his parish priest or "to some other discreet and learned Minister of God's word," but the training of the English clergy in matters of mental direction is by no means profound, and the same thing could be said of the training of medical men.

Mr. Anson's book will be found useful by the layman, the priest, and the medical man, and we advise its study by all who are in any way likely to be called upon to help their fellows in the indicated direction. As a pilgrimage to Lourdes is being advertised to start next month from a London suburb, it would seem that opportunities for giving counsel are not wanting.

HOSPITAL ACCOUNTS AND FINANCIAL CONTROL.

By JOSEPH E. STONE, A.C.I.S., Incorporated Accountant: Accountant to St. Thomas's Hospital. London: Sir Isaac Pitman and Sons, Ltd. 1924. Pp. 160. 21*s.*

Mr. Stone rightly regards accounting, in its widest sense, as one of the essential functions in modern hospital management. Only by careful analysis of the facts relating to its external and internal affairs, and by acting in the light of their interpretation, can any hospital maintain an efficient and economic service. This book reaches a high standard of efficiency which should recommend it to all occupied in the accountancy of our hospitals. Mr. Stone is in favour of a system of accounting by units—that is to say, wards and departments of the hospital—in order to see what the various activities cost and where economies may be effected without impairing efficiency. The extreme care with which the many details have been considered will be highly beneficial to the hospitals which are fortunate enough to possess the necessary staff fully to develop the principles laid down. Particular attention is called to the various sources from which hospitals derive their income, the author having devoted much care and assiduity to the lines on which this work should be conducted at the hospital with which he is associated. Other institutions similarly constituted might well follow the principles here enunciated and the means of attaining them. The price of the book is justified by the value of its contents.

THE LANCET.

LONDON: SATURDAY, AUGUST 16, 1924.

MENTAL DEFECT IN SCHOOL-CHILDREN.

THE proportion of mentally defective persons in the community is not yet a matter of complete agreement. Some estimates of this proportion have been made at different times and in different areas by more or less independent investigators, one of the most recent and most thorough being that of Dr. CYRIL BURT, psychologist to the London County Council, who found a percentage of one and a half among London school-children. The standard adopted has varied with the investigator, and data have usually been incomplete. Dr. G. K. BOWES, in a careful study of children of school age in the rural area for which he is responsible, has discovered so large a proportion of defectives as 3 per cent., and suggests that it should possibly be really 4 per cent. We print on p. 313 his method of ascertainment and some interesting descriptions of individual families. It is probable, as Dr. BOWES himself hints, that the proportion of mentally deficient persons in a rural population is greater than that in a town population, because of the fact that a lower degree of intelligence serves for self-support in a rural area; but on the other hand there appear to be some grounds for thinking that the proportion in the town areas is larger than has been generally stated hitherto. The somewhat disturbing figures suggest the necessity for considering the feasibility of attempting to make a national census of mental defectives. The social and eugenic aspects of the problem of mental deficiency are of sufficient importance to the State to justify such a census in order that the magnitude of the problem may be accurately judged. In the case of children of school age the legal provision and the machinery already exist. The terms of both the Acts of Parliament dealing with mental deficiency make it obligatory upon local authorities to discover all defective children, but it is extremely doubtful whether in any area anything like a complete census is yet available. Local authorities, in particular, who have no special school provision are apt to be slack in the performance of this duty: with others the difficulty is shortage of staff, and, it may be also, lack of experience among the staff in diagnosis of deficiency.

But legal provision and machinery are not enough. There is as yet no definitely fixed standard of what is meant by mental deficiency. Yet in this respect the position to-day is very different from what it was at the time of the Royal Commission on the subject which preceded the passing of the Mental Deficiency Act. Thanks to the efforts chiefly of an army of psychologists, we are now provided with scales of tests, intelligential and educational, which, however imperfect, are of practical value in estimating intellectual capacity, and which in their use allow of greater uniformity in the methods of examiners than was possible before their existence. It is true, of course, that diagnosis of mental deficiency cannot be made by such tests alone—if it were attempted the result would be alarming. But although we are still without generally applicable tests of character, it does not seem impossible to devise some method of "marking" certain social aspects of character, as observed in general behaviour. Dr. S. D. PORTEUS, Superintendent of Special Schools at Melbourne, has indicated the possibilities in this direction in a "social rating scale." A census with a scientific basis of this sort would be of great value. A census based merely on the working definitions of the two existing Acts of Parliament would not be adequate. The vast majority of the cases at present certified under the Mental Deficiency Act are cases of very low grade intellectually—very little higher than the idiots and imbeciles already provided for in the Lunacy Acts; these are by no means so dangerous from a eugenic point of view as many who elude certification, but make as certainly defective and undesirable as parents. At the period of the passing of the Mental Deficiency Act the eugenic aspect had to be slurred over in deference to opposition which emanated more from the heart than the head, but a census that is to be of any practical and scientific value to the nation cannot be thus influenced.

THE PLACE OF CROWNS AND BRIDGE-WORK IN MODERN DENTISTRY.

AT the annual meeting of the British Dental Association at Edinburgh, which has just concluded, Mr. H. W. BENNETTE read a paper on collar crowns in which he unsparingly condemned this method of saving teeth, and in the discussion which followed it was apparent that most of his hearers agreed with him. In considering the evolution of operative dentistry from its lowly beginnings, there are certain methods which stand out as landmarks. Amongst them the use of crowns and bridges represents a notable change in the outlook of the modern dentist. It does not require a very long professional life to have witnessed the gradual evolution of crowns and bridges to their highest point of technical achievement, and their decline in popularity to the present time when so many regard them with disfavour. This decline is not due to the substitution of other methods of greater technical efficiency, but rather to a different outlook on the aims and objects of dental surgery. Even to-day it would be premature to regard the discussion on crowns and bridges as ended, and the obituary notice as read. There are still a large number of dentists both in this country and abroad who use these methods extensively. The pages of dental journals abound in advertisements of various appliances to facilitate the construction of crowns and bridges. A new edition of a popular text-book on crowns and bridges has recently been issued and will doubtless find many purchasers. But although there exists this discrepancy between the academic teaching of dentistry and its practice in many quarters, there can be no doubt that the modern trend is definitely away from these methods of saving teeth.

The reasons which led to the introduction and decline of these operative methods are instructive. Thirty or forty years ago, when great technical advances were beginning to be made in dentistry, the aim of the dentist was to save as many teeth as possible. The local hygiene of the mouth was not entirely disregarded, but it was looked at from a narrow point of view and without much regard to the general health of the patient. Many ingenious methods for splinting loose pyorrhœic teeth were devised on the principle that all teeth which could be used without pain should be retained as long as possible. Relics of this attitude still exist, but they are fast passing away. When teeth were too carious indicate that great care has been exercised in the choice of materials and in the brewing and bottling process.

ORANGE PIERJAC.

(C. A. Labin, Ltd., 53, Piccadilly, London, W. 1.)

This preparation belongs to the well-known type of continental "fruit sirops." It is claimed to be made in France and from fresh fruit and sugar only and to contain no preservatives. The Pierjac had the following composition :—

Specific gravity	1300°
Equivalent to	8 lb. per gallon of sugar.
Sugar (as invert sugar)	79 per cent.
Ash	0·1 "
Acidity (as citric)	1·18 "
Alcohol, gum, glucose, syrup, glycerine, and preservatives (salicylic acid and sulphites)	absent.

These results, together with the presence of a considerable amount of orange pulp, indicate the correctness of the description. That highly refined cane sugar has been employed in this preparation is shown by the low percentage of ash. When mixed with water or soda-water in the proportion recommended Pierjac makes an agreeable beverage with a pronounced but not too strong orange flavour, although to some, especially to adults, the sweetness might be slightly excessive.

"ALOCOL."

(A. Wander, Limited, 45, Cowcross-street, London, E.C. 1.)

This preparation, the full name for which is colloidal hydroxide of aluminium, is supplied in tablet and in powder form, and has claims for consideration in the treatment of disease of the stomach and intestine. As an adjuvant in cases of hyperacidity it has been found valuable in practice. The tablets are supplied in containers of 60 tablets at 3*s.* 6*d.* each. The strength of each tablet is 7½ gr. (0·50 g. of pure "alocol"). They are slightly flavoured and must be broken with the teeth. Their purpose is to make the use of alocol easier for the patient, who can take them at any time and without trouble. "Alocol" powder is supplied in 100 and 250 g. containers at 3*s.* 9*d.* and 7*s.* 6*d.* each respectively. Two tablets should be dissolved in the mouth half an hour before and two tablets half an hour after each meal, unless otherwise directed by the physician.

New Inventions.

A COMBINED ENDO-TRACHEAL PUMP AND SUCTION APPARATUS.

The machine illustrated is an attempt to provide in one apparatus all that is necessary for any type of anæsthesia combined with really powerful suction. It has been constructed by Messrs. Coxeter and Son, Ltd., of 171–175, Pancras-road, London, N.W. 1.

The main features of the apparatus are :—

(1) It is portable, as it is fitted with a wood cover and can be carried by a strap.

(2) It is almost silent in operation. This is due to the motor and pump which are of the Reavell-Moseley type, being direct-coupled without intermediate gearing, in the same case. The rotary pattern pump is much more silent than is the oscillating type, and is almost as efficient.

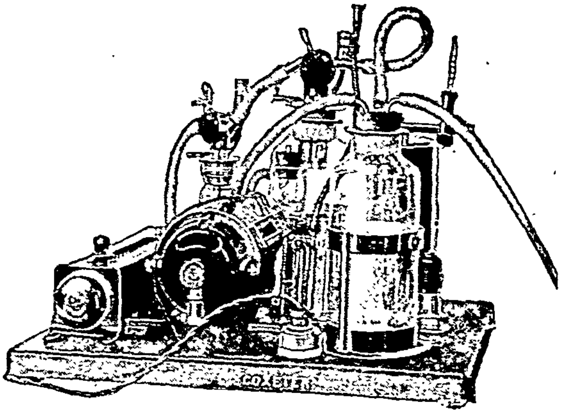
(3) It can be operated on any electric current, direct or alternating from 100–250 volts. This range covers practically every main supply in England, and is effected by employing a double wound motor.

(4) Chloroform, ether, or mixed vapours can be supplied in any proportion at any (measured) temperature and pressure, within fairly wide limits.

(5) An adjustable automatic blow-off prevents the pressure rising beyond any desired value even if the motor is run at full speed during an endo-tracheal administration to provide maximum suction. This feature is of utmost importance in combined machines.

(6) Two filters and two traps are provided between the suction and pressure systems. Furthermore, it is impossible for any liquid particles of anæsthetic to reach the exit tube, however full the bottles may be or however high the pressure.

(7) At full speed the suction is sufficient to aspirate blood clot or thick pus with ease. Thus the apparatus can be used with advantage for dissection tonsillectomies, septum resections, or other proceedings where powerful suction combined with an endotracheal or endo-pharyngeal anæsthesia are necessary.



(8) If the necessary cylinders are available, nitrous oxide–oxygen or ethylene–oxygen can be administered.

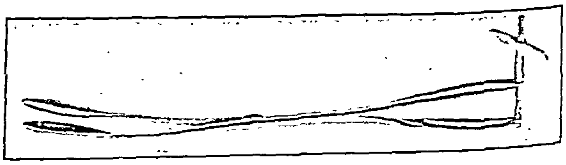
(9) The base-plate of the heater is continued as a support for the ether bottle. Consequently the most concentrated ether vapour can be supplied indefinitely without any freezing in the bottle.

Care has been taken with all the electrical connexions to avoid any possibility of sparks coming into contact with the anæsthetic vapour. This is of vital importance when using ethylene. With nitrous-oxide, the new "dry" gas supplied by manufacturers obviates the necessity for heating the reducing valve, with additional safety from possible explosion.

Regent's Park, N.W. C. Langton Hewer.

A NEW INTRA-UTERINE FORCEPS.

For the removal of retained portions of embryo the blades of the forceps (see figure) are placed in the uterus separately by a method similar to that commonly employed for the application of midwifery forceps. By this means a substantial hold is obtained, rotation can be effected, and "nibbling" small fragments of embryo avoided. The necessary incursions to empty the uterus are reduced to a minimum. Any compression that may be necessary is accomplished by means of the adjustable screw at the extremity of the handles, and as the blades traverse the cervix by lowering this portion of the instrument into the same plane as the handle to which it is attached, an aid to traction is obtained, the handles in the meantime being kept at the requisite degree of apposition by pressure with the left hand of the operator. The lower blade can also be used separately to remove from the uterine wall an early placenta, or other adherent material removable by gross curettage.



The instrument is made in two sizes and can be obtained from H. McClory and Son, 5, Edmund-street, Birmingham.

J. Hargreaves Robinson.
Hon. Surgeon, Royal Maternity Charity of London.

to the gallows: it shows that a dog differs from a man in something more than his anatomical appearance. The parallelism of anatomical and immunological classifications is a field which zoologists might cultivate to advantage.

But in its newer experimental outlook zoology comes much more into relation with medicine, and physiology and pathology have a greater contribution to make to zoology. Prof. Gamble covers a wide field: some of his points only can be mentioned. He gives considerable attention to the remarkable work initiated by Prof. C. M. Child of Chicago on axial gradients. This shows that the head end of an elongated animal is different from the more posterior parts in metabolic intensity and susceptibility to poisons, and that it exerts a variable degree of dominance over the subordinate hinder end. The rate of metabolism diminishes from head to tail, and when the head becomes sufficiently functionally remote from the tail the latter may separate itself off as a new anatomical individual, as in planarians. Normally each cell of an early segmented egg develops into a certain organ or part of an organ. But there is no inevitable predestination in the business. Experimental interference with the arrangement of cells, which under natural conditions is found to be convenient, shows that what the cells of the embryo ultimately become depends much less on what they are than on where they are and how far they come under the influence of the top of the metabolic gradient. The confluence of thought between the experimental embryologist and those who study tumours and their metaplasias is striking.

Another matter in which Prof. Gamble finds food for zoological reflection is the quantitative relation between form and function comprised in the familiar topics of hypertrophy, reserve force, and compensation with the corollary theory that the work of an organ is achieved by its units working by rotation in shifts, thus keeping in good order for functional activity a larger quantity of tissue than is needed in ordinary existence. The relation of these ideas, which have been developed mostly by pathologists, to the biology of live animals is obvious, and we may hope that their consideration by zoologists will lead to a corresponding advance in our understanding of their pathological significance. Prof. Gamble also notices an outcome of factorial genetics of which the possible importance in medicine hardly seems to be realised. Breeding experiments have shown that factors are transmitted in groups, which may be presumed to be the chromosomes. Some combinations of factors, which in themselves have nothing to do with life and death, cannot be actually achieved because the individuals bearing them are not viable. Or they may be achieved under artificial conditions and never occur in nature. There are therefore lethal factors and factors which result in subnormal individuals—phenomena which may have applications to human viability and mortality of very far-reaching importance. We mention only a few examples illustrating the interest of Prof. Gamble's discourse. We would commend its careful perusal to those who think it well to depress the position of biology in the medical curriculum or even eliminate it altogether.

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FORMALDEHYDE IN FOOD.

An Interim Report[1] of the Food Preservatives Committee condemns the addition of formaldehyde or any of its derivatives to food or drink. Formaldehyde was discovered in 1867 by A. W. Hofmann as a gaseous product of the flameless combustion of methyl alcohol, and it was soon manifest that the discovery was one of immense industrial importance, for by reason of its very simplicity—the formula is $\mathrm{H{\cdot}CH:O}$—formaldehyde was found capable of reacting with practically any class of organic, and a large number of inorganic, substances. The high solubility of the gas in water (formalin is the name given to a 40 per cent. solution) made its application technically easy. Its prodigious reactivity made it of high value in the coal-tar colour industry; in tanning it was used for making leather hard and firm; it became popular for coagulating rubber latex, for fixing glues and sizes, for waterproofing fabrics by rendering gelatin or casein insoluble, for hardening the gelatin films of photographic plates, and for preserving anatomical museum specimens. Sir Edward Thorpe's "Dictionary of Applied Chemistry," which gives an excellent précis of the industrial applications of formaldehyde, adds ominously: "It is largely used for the preserving of foodstuffs." Now it is difficult a priori to believe that any substance so renowned as a hardening reagent for all kinds of organic products can be suitably applied to food or to the tissues of the human body which is to ingest that food. The Report lays it down categorically that formaldehyde is a powerful protoplasmic poison, exerting an irritant action upon mucous membranes, causing inflammatory changes in the liver and kidneys after prolonged use, combining with tissue proteins in its passage through the body, and retarding digestion by combining with the protein constituents of food. On all these counts formaldehyde is objectionable as a preservative of food. Further than this, there is the dreadful possibility of its use to conceal incipient decomposition; the Report quotes on the authority of Sir George Buchanan a testimonial from a provision merchant attached to a circular advertising preservative containing formaldehyde, which reads as follows: "It is only right that you should know that the treatment you gave my bacon and cheese with ——— which were previously unfit for food are now saleable articles; therefore, you can supply me with a quantity convenient for my use." The addition of formaldehyde to milk is already illegal, administrative action has secured its removal from imported caviare, and the Departmental Committee on Preservatives recommended as long ago as 1901 its prohibition as an addition to any kind of food or drink. Every country which has made legal enactments or regulations regarding the purity of its food-supply has, explicitly or implicitly, prohibited the addition of formaldehyde, and the Committee appointed by Mr. Neville Chamberlain in July, 1923, has no hesitation in recommending that the addition of formaldehyde or any of its derivatives to food or drink should be absolutely and specifically prohibited.

This Committee is not yet ready to report on its wider reference of preservatives and colouring matters in food, and the sweeping condemnation of formalin has arisen on the request for a special report on the Linley process for preserving chilled beef. The Committee found it could not satisfactorily divorce the particular case from the wider question. The object of the Linley process is to enable beef chilled at a temperature of 29° to 30° F. to reach this country from the Argentine or Australasia in good condition and free from moulds. The process, according to its inventor, consists in the single application of formaldehyde gas before shipment, the amount of formalin evaporated being calculated on a basis of two-thirds of an ounce for every 100 cubic feet of space in the chilling room. For some years before the war chilled beef thus treated was imported from the Argentine, although even then the abattoirs controlled by North American firms did not adopt the process and were yet able to export chilled beef successfully. In 1909 an inquiry made by the Local Government Board resulted in an unfavourable verdict on the meat so treated, and a suggestion was made to the traders to limit the use of formaldehyde to the disinfection of the holds before introducing the meat. The amount of formalin in the treated meat was found to vary within very wide limits, and in some cases it had penetrated 30 mm. or deeper into the carcass. The Linley process ceased with the war and the chilled beef now being imported from the Argentine is carried at a to be filled the method of restoring them by an artificial crown of gold or porcelain was introduced. The crown was fastened to the root either by a collar placed over the root and cemented on, or by a post passing into the root canal and secured by cement. It is obvious that, even with the highest technical skill—still more, if the crown is poorly constructed—there is a tendency for food and bacteria to collect round a device of this kind. In the case of collar crowns there is the added factor that there must be a ledge under the gum which collects debris, no matter how well constructed, and must act as an irritant to the gum and periodontal membrane. For this reason many dentists began to condemn this type of crown on the grounds that it predisposed to pyorrhœa, and was an unclean device. This feeling has been steadily growing, until there are few dentists to-day who would not agree that the collar crown is insanitary and should be abandoned. This is not to say that crowns as a whole are to be regarded as an illegitimate form of dentistry. There is still a wide field of usefulness for crowns, but with the proviso that not only must they be constructed with great accuracy, but also that the crown must fit the root edge to edge so that there is no ledge to collect debris. There has been so general a condemnation of crowns by doctors that it is well to make it clear that properly constructed, and in suitable conditions, a crown may be a perfectly scientific and hygienic method of conserving teeth. Any type of crown, however, which involves a collar fitting over the root and extending below the gum margin is, in the opinion of most dentists, a form of conservative dentistry which leads to dental sepsis and should be discarded.

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[1] Interim Report of the Food Preservatives Committee on the Treatment of Chilled Beef and Other Foods with Formaldehyde. London: H.M. Stationery Office. 2d.

With regard to bridgework, in so far as the abutments of the bridge which are placed on the supporting teeth are collar crowns, then the condemnation of such crowns applies to bridges also. But there is another factor. Each tooth is capable of slight independent movement under the stress of mastication, through the yielding of the periodontal membrane. This buffer-like action lessens the force of mastication. When two teeth are splinted together, as in a bridge, they must both move together, instead of independently, and the stress to which they are submitted will cause them to become loose. In the case of large bridges which bear a considerable amount of impact during mastication, the strain on the abutments will soon cause the loss of the supporting teeth. In the case of small bridges exposed to little or no strain, this factor may not be serious. Added to this there is also the factor of cleanliness. It is difficult to make so complex a piece of apparatus as a bridge self-cleansing. It tends to gather debris far more than a crown, and may become a veritable trap for filth, well meriting the original condemnation passed on bridges by Dr. William Hunter. If the bridge is removable the foregoing objection may have less weight. Such bridges call for a high degree of technical skill. They may have a legitimate place within narrow limits, but not to an extent which seriously qualifies the general distrust of bridgework as a clean method of tooth restoration. Since the advent of the X ray has shown that pulpless teeth, free from symptoms, may sometimes be infected at the apices, crowns have received additional blame. Sir William Willcox, for instance, has stated that all crowns should be extracted because of the apical infection so often present. There is some confusion of thought here. It is not the presence of the crown which leads to apical infection, but rather the infection of the pulp canal consequent on the death of the pulp. Crowned teeth are usually pulpless, but there is no evidence to show they are more frequently the seat of an apical lesion than pulpless teeth which have been filled. The logical extension of such an attitude would be to state that no tooth which had not a living pulp should be retained in the mouth, and that no treatment involving the root canals should be undertaken. This view has been put forward in America by some, but it does not appear to us that the facts warrant so sweeping a statement or so drastic a limitation of conservative dentistry. The presence of apical infection in some teeth which have been treated is a wholesome challenge to the dentist, for it raises the question as to whether dental technique is sufficiently thorough and scientific to exclude infection from devitalised teeth. The dental profession is fully alive to the gravity of this issue. Already the interest aroused has resulted in a notable improvement in root canal technique which warrants the belief that in the near future infection will be eliminated with certainty in the treatment of diseased pulps.

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ZOOLOGY AND MEDICINE.

The presidential address to Section D of the British Association, delivered by Prof. F. W. Gamble at Toronto on August 11th, is of more than usual interest to medicine and its institutes. Taking as his title "Construction and Control in Animal Life," he brings out emphatically the change which in recent times has come over the subject which he professes. Most of last century was occupied with description and classification: "zoology" and "comparative anatomy" were more or less interchangeable terms, and the animation which followed the publication of the "Origin of Species" left the method of inquiry much the same, while it transformed the interpretation of the results. The outlook has now changed again and the dying Darwinian impetus has been replaced by the experimental method. Animals are no longer products which are, within comprehensible periods of time, finished and stable beings; the being, well-being, and becoming of them are no longer problems of statics, but of dynamics. "Regulation" is the keynote of the development of zoological knowledge, whether internally, as by the discovery of the factorial hypothesis, or externally, as in œcological relations. Form has been predominant over function in the formal discipline of zoology; it has been assumed by most people that form has determined function. But function is now coming to the front, zoology and physiology and pathology are fusing their spheres of action, and a good many are wondering whether function does not really determine form. The applications of the older zoology to medical science are obvious enough. It is impossible to investigate the functions and lives of things which have no names, and the intervention of Linnæus was timely. The energy spent on the nicest work in comparative systematics has never been wasted. As the master said, "nomina si nescis, perit et cognitio rerum," and he did well to insist that the live world must be arranged, identified, and put into a form as convenient and lucid as a collection of postage stamps. Every schoolboy who is taken to a museum knows that the being of Anopheles means something different from the being of Culex; the native will learn not to tie up his foreskin for fear of bilharzia when he knows enough about the systematics of snails; it seems likely that some of the most puzzling problems of the distribution and prevalence of plague in India have been solved by the elegant separation of *Xenopsylla astia* from *X. cheopis* by experts in fleas. Pathology has, too, a significant connexion with this side of zoology, through its demonstration of the species specificity of immunological relationships. The identification of a bloodstain by a precipitin reaction does something more than bring a murderer disease—is almost entirely a matter of scientific handling of the product between cow and consumer, and this point is well illustrated in a monograph issued by the Ministry of Agriculture and Fisheries,[1] in which Dr. Stenhouse Williams, of the Research Institute, gives the result of investigation into this problem. During 1916–17 an inquiry into the sources of loss in the milk trade was carried out, and it was found in examining the conditions of supply in two widely separated districts that the chief sources of loss were (1) from milk turning sour before it could be distributed, (2) from splashing in the churns, and (3) from irregularity of supply and demand. Out of a total of 165,000,000 gallons supplied annually by the two districts under examination, the loss due to sour milk was 3,615,441 gallons, representing the large sum of £180,772. The effect of this financial loss is naturally to increase the price of milk to the consumer, and further, there is a very serious wastage of valuable foodstuff. Thus the handling of milk had to be considered in a threefold aspect of bacteriology, mechanics, and economics. In consideration of the first aspect, which involves the keeping qualities of the milk, a comparative series of tests were made in 1916 between the cleanest commercial milk procurable and the average milk from a better class farm. Samples were examined for bacteriological condition and duration of sweetness from the two types of farms. The results showed that where the milk was produced under conditions of strict cleanliness and was cooled immediately it came from the cow to a temperature varying between 45° and 62° F., under all subsequent conditions of temperature the bacteriological counts only rose above 10,000 per 1 c.cm. on three occasions in the course of two years. The average milk, which was sometimes cooled and sometimes not, showed a very different and variable picture. Dr. Stenhouse Williams writes: "It was a revelation that milk which had been properly handled at the farm could maintain so uniform a standard of cleanliness at the end of 24 hours." It was found that clean milk could remain sweet in a cool cellar for an average of 5·8 days, while ordinary milk turned sour after an average of 3·75 days. This question of keeping qualities is one of the greatest importance, as the milk which remains sweet longest is the more marketable commodity. Experience at Reading showed that the poor were willing to buy Grade A (tuberculin-tested) milk, chiefly because its keeping qualities were so much better than that of the milk to which they had been accustomed. There is no surer way of touching the public conscience than through the pocket. If, therefore, clean milk is synonymous with cheaper milk, then we may hope for enthusiasm in the spread of modern hygienic methods in dairying.

THE HOUR OF BIRTH.

IT is an almost universal belief among doctors and midwives that more infants are born by night than by day. Doubtless this belief depends to a large extent on a trick of the memory; we are much more likely to remember an event if it occurred in the night and robbed us of our sleep than if it occurred by day and was one of many thronging incidents following each other with kinematographic speed. To substitute facts for impressions, Dr. O. A. Boije[2] of Helsingfors has recently carried out investigations at his maternity hospital, where he has found that the number of births between 6 in the morning and 6 in the evening was almost exactly the same as the number in the other 12 hours of the 24. His material consisted of 7751 confinements, all of which were terminated spontaneously. There were 3887 in the 12 hours of the day, between 6 A.M. and 6 P.M., and 3861 in the 12 hours of the night. The 24 hours were further subdivided into eight divisions, each of three hours, the divisions being from 6 to 9 in the morning, and so on. The graphic representation of the number of births in each of these eight divisions ran as an almost horizontal line, the difference between the greatest number of births (1059 between 6 and 9 A.M.) and the smallest number (905 between 12 midday and 3 P.M.) being comparatively slight. It has often been taught by the text-books that the hours from midnight to 3 A.M. are those in which a greater number of births are crowded than in any other three-hour period. But in Dr. Boije's material there were only 1018 in this three-hour period of the night. Turning to the hours at which the regular onset of labour begins most frequently, he finds much greater difference than in the case of the completion of labour. The 24 hours of the day being again classified in eight three-hour intervals, it was found that only in 6·5 per cent. of the total did regular labour-pains begin between 12 midday and 3 P.M. From 3 P.M. there was a continuous rise for every three-hour period up to 3 A.M., the maximum being reached in the period 12 midnight to 3 A.M. As great a proportion as 19·6 per cent. of all the labours began at this hour of the night. Almost twice as many labours began during the 12 hours of the night as during the 12 hours of the day, the actual figures being 5084 and 2658 respectively. It would seem that in Finland, at any rate, when labour begins at night, it is usual for a hasty departure to be made to a maternity hospital; whereas when labour begins during the day the departure for a maternity hospital is less precipitate. Consequently many more maternity cases enter hospital by night than by day.

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ANKYLOSTOMIASIS IN THE ARGENTINE.

IN a recent article in *La Semana Médica* Dr. Vaccarezza, Chef de Clinique for Prof. Destefano, deals very fully with the whole question of ankylostomiasis in the Argentine. The disease is widely spread in the north of the country, particularly the province of Corrientes, so much so that 40 per cent. of the recruits from that region show evidence of it on fæcal examination. In some localities practically all the inhabitants are infected. The disease is frequently contracted in infancy, often with very grave results, but after that it is apt to pass unnoticed till adolescence, when the maximum incidence occurs. The blood shows more or less deficiency of red cells, according to the severity, with excess of eosinophiles and often some slight excess of leucocytes. *Necator americanus* is far the most frequent parasite, associated in a large proportion of cases with trichocephalus and others. Dr. Vaccarezza states definitely that the most successful treatment is by carbon tetrachloride in doses of 3 c.cm. for adults; one dose suffices in the majority of cases. If this drug is contra-indicated or fails, the essential oil of chenopodium is the next best; both, he adds, are safer than thymol. As preventive measures the construction of latrines and the use of adequate foot covering are regarded as the most important. The article contains a bibliography of recent Spanish literature on the subject.

CHANGES IN THE COMPOSITION OF THE URINE AFTER MUSCULAR EXERCISE.

THE studies of D. Wright Wilson and some of his colleagues on changes in the composition of the urine after exercise[1] are worthy of record. The effect of short periods of strenuous exercise on the urine was studied by comparing the urine from normal men in a resting condition, collected in ten-minute slightly lower temperature—namely, 27° F. The reason given for desiring resumption is that under present conditions the journey from Australia is too long to permit successful transport of chilled beef to this country without the aid of the Linley process. The Committee considered whether it might not be possible to permit the use of formaldehyde after prescribing a limit for the amount which might be present, say 2 to 3 parts per million in a surface layer of beef 7 to 10 mm. thick; but they decided that control would be difficult, and that similar liberty would have to be given to meat traders in this country. On the whole they came to the conclusion that the true interests of trade would not be furthered by a revival of the practice, and it is gratifying to learn that the undesirableness of using formaldehyde as a preservative is generally recognised by the traders themselves. We are glad of this Interim Report and trust that there may be no delay in taking the step of making formaldehyde illegal in the preservation of foods and drinks.

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[1] Studies concerning the Handling of Milk. Miscellaneous Publications, No. 11. London: Ministry of Agriculture and Fisheries, 10, Whitehall-place, S.W. 1. 1924.

[2] Finska Läkaresällskapets Handlingar, May–June, 1924.

[1] Proc. Soc. Exp. Biol. and Med., vol. xxi., May, 1924.

Annotations.

"Ne quid nimis."

CHARITIES AND THE ENTERTAINMENT TAX

DURING the recent discussion on the report stage of the Finance Bill, Mr. Snowden, Chancellor of the Exchequer, proposed a new form of words for the clause providing that entertainment tax should not be charged on entertainments promoted for certain objects. While, he said, it was necessary to protect the revenue against exploitation of charities by private individuals, he thought, and the House of Commons agreed with him, that any society or institution of a permanent character, established or conducted solely or partly for philanthropic or charitable purposes (or by two or more such societies or institutions acting in combination) when devoting the whole of the net proceeds of entertainment to philanthropic or charitable purposes, should be entitled to claim repayment of the tax, but on the understanding that the whole of the expenses of the entertainment did not exceed 50 per cent. of the receipts. The concession, which is a reasonable one, is very welcome in its effect on entertainments promoted for hospitals and other medical charities.

AN ARRAIGNMENT OF THE BOBAC.

THE tarabagan or bobac is a marmot widely distributed over the uplands of Eastern Siberia and Northern China. In appearance it resembles the bland, inoffensive rodent familiar to all climbers in the European alps, and in America under the name of woodchuck. Nothing except a noisy whistle and an undue appetite for succulent vegetables has been urged against the European and American members of the genus Arctomys, but evidence is now conclusive to incriminate the Asiatic bobac as the carrier of pneumonic plague. This has long been suspected, an early writer on the subject being Dr. M. T. Schreiber, whose article in the Russian *Vratch* of 1907 was published shortly before he himself died of the disease in the Government laboratory near Petrograd. A number of outbreaks in the tarabagan were recorded in his paper, as well as the fact that epizoötics occurred among these beasts without, as he believed, human beings becoming infected. In 1910–11 a medical commission, under the leadership of Prof. Metchnikoff, went out to investigate fatal cases of pneumonic plague then occurring on the Khirgiz steppes, where the place of the bobac is taken by another species of Arctomys known in Russia as the sūslik. The susliks were not found to harbour fleas, although commonly enough a small tick was lodged behind the ear. Next, as a result of the International Plague Conference held in Mukden in April, 1911, the Chinese Government instituted in North Manchuria a plague prevention service under the directorship of Dr. Wu Lien Teh, whose report, read at the International Congress of Medicine in 1913, appeared in extenso in our columns.[1] On the evidence then available Dr. Teh satisfied himself that though the bobac does occasionally suffer from plague, the epizoötic was never extensive and the animal does not play nearly so important a rôle in the spread of plague as did the rat. He considered, indeed, its direct relationship to human plague as negligible, the tarabagan, fortunately, eschewing domesticity. We have just received[2] Volume IV. of the series of reports, in which Dr. Teh returns to the matter of pneumonic plague in relation to the tarabagan and revises his conclusions. Previous observations upon the tarabagan have been made rather by native hunters than by trained medical men, for the Tartars, he says, from the time of Marco Polo have described this beast under the name of Pharaoh's mouse. Hasty deductions may readily be made: the tarabagan often has a deposit of fat in the axilla which is apt to be mistaken, even by practised observers, for the characteristics of pest; unsteadiness of gait hastily regarded as due to plague has now been noted in tarabagans dying of other diseases. Dr. Teh is definitely prepared to state that sporadic outbreaks of plague occurring almost yearly in Transbaikalia, and which on two occasions (1910–11 and 1920–21) invaded Manchuria, causing the death of 60,000 and 9600 persons respectively, do actually owe their origin to the tarabagan. Other rodents are encountered in the country, but no case of human infection has ever been traced to them. The disease exists naturally among tarabagans in both acute and chronic forms and can be produced experimentally in both forms. Attempts to infect animals by ecto-parasites—flies, lice, and ticks—have failed, a prominent difficulty lying in the fact that the tarabagan is no passive laboratory animal, but a strong and vicious creature. In infected animals an acute pneumonic process is quite a common post-mortem finding. Although naturally herbivorous, the tarabagan is apt to devour the carcasses of its mates, and positive transmission has been recorded by this means. Three out of 18 cases showed a chronic or subacute condition with greyish nodules in spleen, lungs, and liver. Dr. Teh considers four possible routes in the transmission of plague from tarabagan to man. Russian observers have long believed that plague in Siberia is caused by the eating of tarabagan flesh, but there is no scientific evidence in support of this view. The possibility of infection from inhalation is remote, for the animal is either shot or trapped, and the hunter is seldom if ever in close contact with the beast in an enclosed space. But hunters do not use gloves; their hands are often chipped, and during skinning operations the plague bacillus may readily gain entrance directly into the circulation through the open wound. There are many records of such infections. Indirect transmission by ecto-parasites from a naturally infected tarabagan has not been yet observed, although Dr. Teh regards it as quite conceivable in view of the cognate work upon the rat-flea in India. Dr. Teh may be regarded as having finally convicted the tarabagan or bobac of being a carrier of pneumonic plague.

THE HANDLING OF MILK.

THE production of clean milk has now been widely recognised as one of the most important factors in a healthy food-supply for the nation, and during the past ten years it is largely to this end that the work of the National Institute for Research in Dairying at Reading (see THE LANCET, July 26th, p. 173) has been directed. The question of clean milk—granted, of course, that the animals are free from disease—is almost entirely a matter of scientific handling of the product between cow and consumer, and this point is well illustrated in a monograph issued by the Ministry of Agriculture and Fisheries,[1] in which Dr. Stenhouse Williams, of the Research Institute, gives the result of investigation into this problem. During 1916–17 an inquiry into the sources of loss in the milk trade was carried out, and it was found in examining the conditions of supply in two widely separated districts that the chief sources of loss were (1) from milk turning sour before it could be distributed, (2) from splashing in the churns, and (3) from irregularity of supply and demand. Out of a total of 165,000,000 gallons supplied annually by the two districts under examination, the loss due to sour milk was 3,615,441 gallons, representing the large sum of £180,772. The effect of this financial loss is naturally to increase the price of milk to the consumer, and further, there is a very serious wastage of valuable foodstuff. Thus the handling of milk had to be considered in a threefold aspect of bacteriology, mechanics, and economics. In consideration of the first aspect, which involves the keeping qualities of the milk, a comparative series of tests were made in 1916 between the cleanest commercial milk procurable and the average milk from a better class farm. Samples were examined for bacteriological condition and duration of sweetness from the two types of farms. The results showed that where the milk was produced under conditions of strict cleanliness and was cooled immediately it came from the cow to a temperature varying between 45° and 62° F., under all subsequent conditions of temperature the bacteriological counts only rose above 10,000 per 1 c.cm. on three occasions in the course of two years. The average milk, which was sometimes cooled and sometimes not, showed a very different and variable picture. Dr. Stenhouse Williams writes: "It was a revelation that milk which had been properly handled at the farm could maintain so uniform a standard of cleanliness at the end of 24 hours." It was found that clean milk could remain sweet in a cool cellar for an average of 5·8 days, while ordinary milk turned sour after an average of 3·75 days. This question of keeping qualities is one of the greatest importance, as the milk which remains sweet longest is the more marketable commodity. Experience at Reading showed that the poor were willing to buy Grade A (tuberculin-tested) milk, chiefly because its keeping qualities were so much better than that of the milk to which they had been accustomed. There is no surer way of touching the public conscience than through the pocket. If, therefore, clean milk is synonymous with cheaper milk, then we may hope for enthusiasm in the spread of modern hygienic methods in dairying.

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[1] THE LANCET, 1913, ii., 529.

[2] North Manchurian Plague Prevention Service. Reports 1923–24. Pp. 314, with map, coloured plate, and micro-photographs. Tientsin Press, Ltd. 1924.

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THE studies of D. Wright Wilson and some of his colleagues on changes in the composition of the urine after exercise[1] are worthy of record. The effect of short periods of strenuous exercise on the urine was studied by comparing the urine from normal men in a resting condition, collected in ten-minute periods, and then, after exercise in running up and down stairs had been introduced, making further collections of urine. The object of the investigation was to learn the rapidity and extent of the response of the kidney to the chemical and physical changes taking place in the organism. There was a marked fall in the urine volume after exercise which could not be overcome by drinking small quantities of water at frequent intervals. A considerable increase in the excretion of acids and the conservation of bases were demonstrated by the rapid increase in the hydrogen-ion concentration, titratable acidity, ammonia, and ratio of ammonia to total nitrogen of the urine. The inorganic phosphates increased in parallel degree to the acid excretion. The values reached a maximum in 20 minutes, and returned to normal in less than an hour. The hydrogen-ion concentration frequently returned to normal more slowly, and the phosphate excretion always fell below normal toward the end of the experiment. There was a marked fall in the chlorides, which apparently was not due to the decreased fluid output or to loss of chlorides in the perspiration. The excretion of chlorides fell to a minimum in 20 minutes after exercise and then returned to normal. There was a considerable fall in the nitrogen excretion, but no characteristic change in creatinine due to exercise. The changes observed in the composition of the urine, when compared with the variations in the composition of the blood observed by Barr and his collaborators, indicate that the kidney responds rapidly and efficiently to aid the neutrality regulation in the body. By similar collections of urine in ten-minute periods in men, the excretion of lactic acid after exercise was determined by Clausen's method. After one or two minutes' strenuous exercise the lactic acid excretion rose from a normal of about 2 mg. in ten minutes to 150 mg. in ten minutes. The excretion reached a maximum within 20 minutes after exercise, and then fell rapidly. There was a return to normal in about one hour.

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[1] Studies concerning the Handling of Milk. Miscellaneous Publications, No. 11. London: Ministry of Agriculture and Fisheries, 10, Whitehall-place, S.W. 1. 1924.

[2] Finska Läkaresällskapets Handlingar, May–June, 1924.

[1] Proc. Soc. Expt. Biol. and Med., vol. xxi., May, 1924.

AYURVEDA.

WE have received a copy of the first issue of the *Journal of Ayurveda*, a monthly periodical published in Calcutta and edited by a Sanscrit scholar who was trained initially in the Western system of medicine. A readable and modest paper on the aims and ideals of Ayurveda by Capt. G. Srinivasa Murti, I.M.S., is followed by a speculative essay on the place of bacteria in the Oriental scheme of medicine. We have next an article on the therapeutics of mica and its medicinal preparations, and material is here supplied for an inquiry by Western pharmacologists. A short history of the Ayurvedic system and a note on its renaissance conclude an interesting journal, to which is appended a report on the Fourteenth Ayurvedic Conference, held at Colombo last April. This magazine forms a curious contrast to such publications as the modernised "Charaka Sambita" and the "Ayurvedic System of Medicine," both published in English a few years ago, in which extravagant claims were put forward for Ayurveda, joined with stupid denunciations of Western medicine. This active hostility to Western medicine alienated the sympathy that the traditional therapy would have received from progressive Western medicine, but now that Ayurvedic medicine is working to use the advances made by modern science it should receive from the West open-minded treatment. Two potent stimuli have recently energised Ayurveda: the Reforms Scheme, and a newly-aroused desire on the part of I.M.S. administrative officers and others to put the system through a full scrutiny. Two inquiries have been held: one by the Government of Madras, the report on which has just been published and is highly interesting and instructive; the other by the Government of Bengal, the report on which is impatiently awaited. The greatest modern champion of modern Ayurveda was the late Sir Pardey Lukis, who, years ago, thought that modern Ayurvedic practice might come to hold an important place in the medical work of India. Medical administration is now a transferred subject, and Indian ministers holding this portfolio in the Provinces have not been slow to foster the indigenous systems of medicine. Allotments have already been made by some Provincial Governments to promote the extension of Ayurveda, for which colleges, hospitals, and dispensaries are being opened in many parts of India. There are over a hundred millions of people in India who cannot get Western medical treatment, and there are many millions who suffer and die without receiving medical care of any kind. The country is so vast that Government is unable to provide for the medical treatment of everyone. We welcome the prospect that many of these unfortunates will be within reach of modern Ayurvedic practitioners and that they will have something beyond charms and incantations to rely upon. For these and other reasons we hope the indigenous system of medicine will receive further encouragement.

THE TEACHING OF HEALTH IN SCHOOLS.

WE had occasion in our issue of August 2nd to notice the booklet on "The Practice of Health" issued under the auspices of the Headmasters' Conference as framing the teaching of a subject of the first importance along lines which were impracticably generous. The matter is dealt with again by Dr. H. O. West, of Margate, in the *Preparatory Schools Review* (June, 1924, p. 53). Enthusiastically in favour of some such regular instruction, he urges that it must be of the simplest character and limited to elementary essentials which are within easy comprehension. A syllabus does not define the standard to which a subject shall be taught, but the one he proposes seems to omit nothing of importance, and is as follows:—

1. The romance of public health. Bygone days, famous names, present opportunity.
2. The air we breathe. Composition, impurities, ventilation.
3. The water we drink. Sources, purity, impure water and disease.
4. The food we eat. Different kinds, use and abuse.
5. The sunlight we need. Rays and their properties.
6. The houses we live in. Garden cities, overcrowding.
7. The refuse we get rid of. Various methods, drainage.
8. The bodies we have. Unity of life, cells and their functions, rest and exercise.
9. The germs we use and those we suffer from. Infection and disinfection, immunity.
10. The diseases we can defeat. Causes, methods, epidemics.
11. The generation to follow. Practical application.

Applied with a sensible discretion, this should be a satisfactory general guide. He also suggests that some, at any rate, of the instruction might be given by the school medical officer rather than the masters, and that a certain amount of hygiene might be incorporated into the literary and historical studies of the pupils. Healthiness and history have not been studied together as they might have been, and there is no doubt that, for example, plague in England from 1348-1667 and the falling death-rate of the nineteenth century are historical factors which have to be taken into serious account in any attempt to understand what went on in these periods. Such a method of treatment also reduces the danger of teaching children to make too much of their personal healthiness; as such a quest per se is hardly an ideal of the highest order.

THE AMERICAN MEDICAL WAR SERVICES.

WHEN if ever the time comes for a general mobilisation of the fighting forces in the United States of America half a million men will be immediately required for the care of the sick in the armies and hospitals. Surgeon-General M. W. Ireland lays down[1] the urgent duties of the medical corps in a general mobilisation as (1) to protect the interests of the country in the medical examination of reservists (a duty at first requiring many medical officers, who are soon available for service elsewhere), (2) to protect the health of the new forces, and (3) to prepare vaccines on the scale required. On the mobilising day the war department will tell the medical department the total force aimed at, and the time allowed for mobilisation—the standard idea being four million men in one year. Hospitals must be quickly ready, for 5 per cent. of the reservists will want hospital treatment at once. Three-quarters of the medical corps, or about half a million in all, will be wanted for the care of the sick. Sanitation is, primarily, the responsibility of the local commander, but technical experts must be provided by the medical corps at once; and the number required will tend to increase as the war goes on. So urgent are the calls of medicine on mobilisation that the war department gives priority to medical personnel over the combatant services, and 45,000 medical men will be required at once, while 20,000 will be called up later, leaving one doctor to 1300 of population. Nurses will be left in about the same proportion. Medical men will be called up not individually, but in units. Next in importance to personnel is material; lists of all equipment for all varieties of service are being completed, and the difficult question of replacement is being faced. Replacement will at first be carried out from the reservists, but there are highly skilled technical experts who will advise the department in war time as to where supplies are to be obtained. Some demands have already been assigned by the Assistant Secretary of War to particular districts. Organisation will be improved by the fact that all the newly passed army medical students were educated in the one school, which, for a quarter of a century, it had been the aim of the medical corps to provide—a school having hospital, museum, and library within the same ring fence, and designed to become in time a noble centre of medical learning.

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[1] The Military Surgeon, July, 1924.

NEPHRECTOMY IN BILATERAL RENAL TUBERCULOSIS.

A FEW years ago most surgeons would have refused to perform nephrectomy where both kidneys were tuberculous, perhaps they would do so even now. But a good case has recently been made out for removing the most diseased kidney, and the advocate of this course, Prof. G. Ekehorn,[1] of Stockholm, speaks with an experience of about 200 cases of renal tuberculosis coming to operation. It is encouraging to find that renal tuberculosis is, on the whole, seen by the surgeon in an earlier stage than heretofore, and Prof. Ekehorn has observed an appreciable diminution during the last few years in the number of patients coming to him in an advanced stage of renal tuberculosis. But he has seen as many as 27 cases in which the disease was so advanced that he could not carry out all the usual tests, and in five cases not only was catheterisation of the ureters impossible, but he could not even examine the bladder by cystoscopy. The fate of such cases is usually expectant treatment. The course adopted by Prof. Ekehorn was more active; the kidney thought to be least damaged was explored by an operation, and when not found to be too extensively damaged, the more diseased kidney on the other side was removed. In seven cases the operation was confined to exploratory exposure of the kidneys. In the remaining 20 cases the most diseased kidney was removed, the disease having completely, or almost completely, destroyed the kidney in 11 cases and having damaged it extensively in the remaining nine. The wounds on both sides were usually closed completely and without drainage, and though the operations were performed on the same occasion, the patients tolerated them satisfactorily, and in almost every case were better afterwards, as shown by diminution of the bladder symptoms and of the pus in the urine. Indeed, two of the patients were discharged as "well." These patients were operated on in Upsala and Stockholm between 1910 and 1922, and with a view to ascertaining their subsequent fate Prof. Ekehorn addressed inquiries to them in the autumn of 1922. He obtained no answers from five of the 20 on whom nephrectomy had been performed, and he found that ten other patients had died. One of them had lived for six years, another for two, and a third for a year and ten months after the operation. Five were still alive, and two of them were still able to do heavy work, although 12 years had elapsed since nephrectomy had been performed. They had to pass water more than once during the night, but they had no pain or other symptoms, and the urine contained no albumin. A third patient, operated on five years earlier, still had a trace of albumin in the urine and micturated frequently, but he had no pain and could work as before. It is on the strength of evidence such as this that Prof. Ekehorn favours nephrectomy in bilateral renal tuberculosis, when there is clear evidence that the most diseased kidney is largely responsible for fever, pain, and other symptoms.

THE BRITISH DENTAL HOSPITAL.

WE have before us the twelfth annual report of the British Dentists' Hospital (offices, 31, Camden-road, London, N.W. 1), which was founded in 1911 to assist the large class of persons who, while possessing limited means, are unable to pay the ordinary charges of dental surgeons in private practice. At the next annual meeting the name of the hospital will be changed to the British Dental Hospital, which indeed seems desirable, inasmuch as the beneficiaries under the scheme are not the dentists themselves, who act in a purely honorary capacity, but the very large number of patients who are benefiting from the scheme. Small fees on a regular scale are charged for every service rendered, with the result that the hospital pays its way, and the whole work is done not by students but by qualified dental surgeons, numbering at present 37, who must also be members of the British Dental Association. From the outset the work of the hospital has constantly expanded, branch centres have been established taking over the dental work of various official bodies such as that of insurance committees and child welfare centres, tuberculosis patients under the Ministry of Health, and London County Council school-children. Special equipment is maintained for the service of tuberculous patients in the clinics at Battersea, Greenwich, Hampstead, Holborn, Lewisham, Paddington and Wandsworth. At Battersea the increase of patients from maternity and child welfare centres has necessitated an additional half-day a week at the clinic. In Shoreditch a dental clinic has been established at the borough council's new model welfare centre. In the case of one approved society, 50 per cent. of the male membership now has the opportunity of obtaining dental treatment from the hospital. Unfortunately the expense of dentures seriously restricts the supply to mothers from maternity centres, who stand so much in need of them. Prevention stands high among the aims of the hospital, and the staff, besides practising conservative treatment wheresoever practicable, instructs patients in such ways of life as will ensure the least amount of dental disease in the future. At the treatment centres and clinics during 1923 nearly 1900 sessions were held, with a total of over 17,000 attendances and more than 19,000 extractions. There were 3153 fillings, 652 scalings, 1337 dentures supplied or repaired, 3107 cases of advice given, and 706 dressings and root treatments. With these figures, obviously prevention is still in its infancy, and the hospital may be regarded as a plucky and successful attempt to supply part of a great national need.

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[1] Hygiea, June 15th and 30th, 1924.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXIV.—THE TREATMENT OF PSORIASIS.

Unfortunately the treatment of psoriasis is still in a very unsatisfactory position. Probably no great progress will be made till the cause of the disease is known. In many cases the eruption can be removed, if not permanently, at least for some years. In the bad cases, which relapse almost immediately after treatment is stopped, one can only hope to ameliorate the condition without curing it. The treatment may be either external or internal.

External Treatment.

This varies according as the eruption is spreading or stationary. If the eruption is spreading rapidly, is itchy, and shows numerous small recent spots, rest in bed is almost essential. If the patient goes about, the rubbing of the clothes and alterations in temperature tend to increase the spread. Rest in bed slows down the circulation and keeps the skin at an even temperature. All strong applications should be avoided. There is a great temptation to apply some strong ointment to check the eruption; but this never succeeds and simply leads to a further spread. The only way is to soothe the skin till the eruption stops spreading, and not till then is the actual cure begun. An ordinary warm bath should be given daily, and the scales washed off with plain soap and water. If the case is not too acute sulphur baths (potassa sulphurata ℥ii or a packet of sulphaqua to each bath) are often very beneficial. Night and morning plain vaseline or an ointment of 5 parts of soft paraffin and 1 part of hard paraffin should be rubbed in. After a week or ten days the eruption ceases to spread. The baths should be continued, but in place of the vaseline the following ointment should be used: ℞ sulph. præcip. and ac. salicyl aa gr. iiss, lanolin and vaseline aa ℥ss. This is continued as long as there is an improvement. As soon as the improvement ceases the sulphur and salicylic acid are increased to gr. 5 to ℥i (i.e., 1 per cent.), and later to gr. 10 to ℥i (2 per cent.). Finally crude coal tar, painted on very thinly with a stiff brush, should be applied to one area, and allowed to dry on and remain on for 24 hours. If no irritation is caused, the tar should be applied to all the other areas in rotation, doing the arms on the first day, the legs on the second, the front of the body on the third, and so on, taking about five days to paint all the spots. Each spot in this way gets tar for one day and the 2 per cent. sulphur salicylic ointment for the other four days. As the eruption becomes paler the tar should be painted on every fourth day, then every third day, every second day, and finally, when there are only a few spots left, every day. The patient should be kept in bed till the tar is found to be suiting the skin. In men, if the hair is cut short, the scalp can be tarred like the rest of the skin. The tar washes off easily if any grease such as the sulphur salicylic ointment is applied. Wood tars, such as ol. cadini, are not so efficacious as the crude coal tar, besides having the great disadvantage of the strong smell. Cases after treatment with crude coal tar, if thoroughly done, are much less liable to relapse than after any other form of local treatment. The course of treatment takes from eight to ten weeks to effect a cure.

In cases where the psoriasis is extensive but no longer spreading the same treatment should be applied, beginning with the 1 per cent. sulph. salicylic ointment and going on rapidly to the stronger ointment and tar. Chrysarobin ointment is only useful in stationary cases, and should never be used if the eruption is itchy or spreading. It is not suitable for ambulatory cases. When it is used, it should be continued till the spots, which at first turn white, are beginning to show a pink colour again. After the chrysarobin treatment the case should be treated with crude coal tar to prevent recurrences. In many stubborn cases X rays will be found very useful. They should be applied once a fortnight in doses of one-half Sabouraud pastille at a distance of 15 cm. from the centre of the tube. With an ordinary gas tube the exposure is about seven to eight minutes. Usually two applications are sufficient to cause a marked improvement. The rays are especially useful when the eruption affects areas where it is difficult to get ointments into the lesions, such as on the palms and soles and the scalp. When applied to the scalp the dose is not sufficient to bring the hair out. It must be remembered, however, that the eruption does not stay away for any length of time after X rays. The ordinary local treatment must be applied at the same time. Whatever form of local treatment is applied it must be thorough. The scalp must be specially attended to as the disease is frequently left incompletely cured in that area. Unless every spot of disease is removed one cannot hope to prevent a recurrence.

Internal Treatment.

Drugs as a rule are rather unsatisfactory. Arsenic should be tried as Fowler's solution ♏ 5 t.i.d., but is only useful in stationary cases. Larger doses than ♏ 5 are useless, because if the arsenic is pushed till the patient is ill from it the psoriasis will improve temporarily, just as it does if the patient takes any acute illness such as pneumonia. As soon as the patient recovers from the arsenic the eruption recurs. The same remarks apply to thyroid extract. If a result cannot be obtained with small doses no permanent effect will be produced by large doses. The newer arsenical preparations of the arsenobenzol group have been tried, but the results obtained were disappointing. In spreading cases and also in chronic cases salicin gr. 10 t.i.d. is much more likely to do good than arsenic. Alkalies such as pot. citrat. gr. 15, together with mag. carb. gr. 5 t.i.d., are also sometimes useful. The reason for giving alkalies is based on the theory that in psoriasis the skin is too acid. From analogy with seborrhœic conditions, which are somewhat allied to psoriasis, there is some evidence that the skin is more acid than normal. The acne bacillus, which many believe to be identical with the seborrhœa bacillus, will only grow outside the body in an acid medium. Assuming that the skin is more acid than normal in psoriasis, that would explain why some individuals get psoriasis, and others, with less acid skins, do not. It is possible that in psoriasis there is a bowel infection with fermentation and the production of acid. Dieting should be tried in all cases. Psoriasis is certainly not due to any particular food, but good results may sometimes be obtained by cutting out or cutting down certain groups of foods, such as sugars, starches, meats, fats, and acid fruits. Each group should be cut down to the minimum in rotation. If an improvement is going to take place it will show itself within ten days or so. If this form of dieting produces no results, sending the patient to one of the spas, such as Harrogate, to get the bowel thoroughly cleared out does good in some cases. Drinking the waters alone is not usually sufficient; the lower bowel should be washed out by the Plombières douche. Vaccines made from the bowel contents have also been tried, but the results are usually disappointing.

Non-specific Protein Therapy.—In cases where all the above methods fail to give relief non-specific protein therapy may be tried. For this purpose sera, peptone, and sterilised milk have been chiefly used. Of the three, sterilised milk is the one to be recommended. If a foreign serum is used, such as horse serum, there is always the risk, although perhaps not a [illegible] t one. of anaphylactic shock [illegible] tient's own serum is used reactions, and [illegible] the technique which is th[illegible] the [illegible] necessary to prepare the serum. It is difficult in practice to defibrinate the blood, centrifuge it, and keep it sterile. Intravenous injections of sterile peptone are more easily given, but I have never seen any benefit from their use in psoriasis. Intramuscular injections of sterilised milk are easily given and with ordinary care there is no risk. Ordinary fresh cow's milk is used. The milk should be as fresh as possible because, if kept for some hours, the growth of organisms in it produces toxic substances, which cause a marked rise of temperature after the injection. The injections should be given in the forenoon, and that morning's milk should be used. About half a pint of milk, together with a teaspoon, is placed in a small jam-jar, which in turn is placed in a pan containing water. The water is boiled for 15 minutes. The jar is removed from the pan and the "scum" removed from the top of the milk with the teaspoon. Some of the milk is then drawn up into a sterilised Record syringe, and injected with a long needle deeply into the gluteal muscle in the same way as the insoluble salts of mercury are given in the treatment of syphilis. Injections should be given twice a week, and not at longer intervals, so as to prevent any risk of sensitising the patient to the milk. For an adult the first dose should be 2·5 c.cm., the second 5 c.cm., the third 7·5 c.cm., and the fourth 10 c.cm., followed by two more injections of the same dose. Children should have 1 c.cm., 2 c.cm., 3 c.cm., and 5 c.cm. successively. Six injections should give the desired result. There is no object in giving more. Each injection is followed in two to three hours by a marked leucocytosis of the blood, and in three to four hours there may be a rise of temperature, usually to 100°–101° F. The temperature only remains up a few hours, and is not essential for the production of results. The leucocytosis seems to be the essential factor. The fresher the milk the less likelihood is there of any marked rise of temperature. If the temperature reaction is very noticeable the dose of the next injection should not be increased. The only risk connected with the injections is the possibility of the milk being injected direct into a vein and fat emboli being produced. This can be avoided if the piston of the syringe is slightly withdrawn before injecting the milk. If no blood enters the syringe, then it is safe to give the injection. If blood does appear in the syringe it is best to withdraw the needle, empty the syringe, and refill it with milk, and inject in another place. Injections should be given into each buttock alternately.

The above method has only an indirect effect on the psoriasis, and should always be accompanied by local treatment as well. When local treatment is applied it is much more efficacious and rapid in its action than it would be had no injection been given. If chrysarobin ointment is used the same effect is produced in a few days as would have taken three to four weeks in the ordinary course. Similarly tar and other applications act very much more rapidly than usual.

Finally, there is another factor which should never be forgotten in the treatment of psoriasis. The taking of alcohol in any form, even in small quantities, such as in light beers, &c., nullifies the effect of any kind of treatment.

R. CRANSTON LOW, M.B., F.R.C.P.,
Lecturer on Diseases of the Skin, Edinburgh
University, and Assistant Physician to
the Skin Department, Royal
Infirmary, Edinburgh.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Special Articles.

THE INFLUENCE OF FOG ON MORTALITY FROM RESPIRATORY DISEASES.

BY W. T. RUSSELL,
CHIEF STATISTICAL CLERK, NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

(*Communicated by* DR. JOHN BROWNLEE.)

THERE has been much conjecture as to the influence of fog in the causation of deaths from respiratory disease, but so far as I know the analysis of the subject has never been placed on a quantitative basis. Regarding the conditions which produce the city fog, it is generally admitted that the emission of smoke from the chimney of the factory and the home is an important factor. This pollution of the air has been frequently the subject of discussion. Years ago, Evelyn, one of the founders of the Royal Society, endeavoured to focus public opinion on London smoke, which he satirically described as the "hellish and dismal cloud of sea-coal which maketh the City of London resemble the suburbs of Hell," and to counteract its evils suggested "the plantation of pleasantly odorous trees." The late Dr. Russell, of Glasgow, wrote a strong condemnation of smoke and its ill-effects, and the passage deserves reproduction in its entirety.

> "Whenever the scavenging of the air is interrupted by calms, so that smoke products accumulate, the atmosphere of our streets thickens and daylight becomes twilight. If a slight wind shifts so as to fold over and double the coverlid of smoke, then at mid-day we have mid-night. Smoke not only loads fog with impurities but tends to produce fog. When, therefore, in the winter we happen upon a low temperature, a high barometer and a dead calm, we have an arctic night with a mephitic, irresponsible atmosphere in which we move about choking, our eyes irritated, our faces grimy—'a purblind race of miserable men.' It is then that our pulmonary mortality is run up, and the death-rate of the year determined."

In recent years, the researches of Prof. Leonard Hill deserve special attention. He has repeatedly drawn attention to the damage caused by smoke and fog in their obstruction of the antiseptic sunlight, and has pointed out that in London "for a period between Jan. 24th and Feb. 7th, 1880, the death-rate rose from 27 to 48, and in 1892, after a fortnight of fog, it rose to 42."

Fog as a Factor in Respiratory Death-rate in Glasgow.

In a paper read before the Sanitary Association of Scotland, Councillor Smith, of Glasgow, gave a very interesting account of the manner in which fog in the winter of 1909 increased the number of weekly deaths from respiratory disease in Glasgow. The effects were very well defined, as will be seen from Table I.

TABLE I.

Week ending—	No. of deaths.	Temperature.	Weather conditions.
Oct. weekly average	35	49·2	Clear to dull.
Nov. 6th	61	45·0	Three days fog.
„ 13th	75	44·0	Dull, slight fog.
„ 20th	138	39·7	Five days dense fog.
„ 27th	233	40·3	Hazy.
Dec. 4th	171	42·3	Hazy or wet.
„ 11th	198	37·0	Four days fog.
„ 18th	137	38·5	Slight haze.
„ 25th	95	31·9	Slight fog and clear.
Jan. 1st	93	43·1	Wet or clear.

It will be observed, however, that the statistics refer only to a particular year, and this limitation in the data must place a reservation on accepting the conclusions until the results of a series of years have

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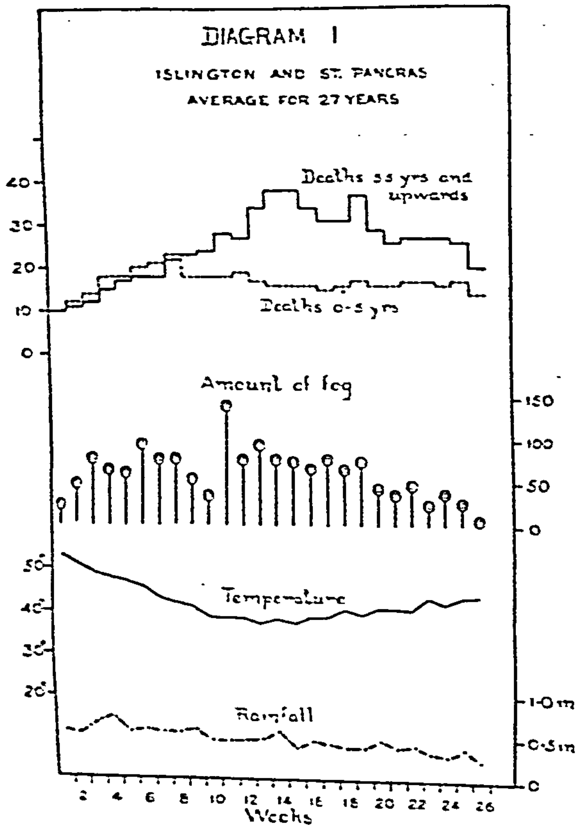
Drugs as a rule are rather unsatisfactory. Arsenic should be tried as Fowler's solution ♏ 5 t.i.d., but is only useful in stationary cases. Larger doses than ♏ 5 are useless, because if the arsenic is pushed till the patient is ill from it the psoriasis will improve temporarily, just as it does if the patient takes any acute illness such as pneumonia. As soon as the patient recovers from the arsenic the eruption recurs. The same remarks apply to thyroid extract. If a result cannot be obtained with small doses no permanent effect will be produced by large doses. The newer arsenical preparations of the arsenobenzol group have been tried, but the results obtained were disappointing. In spreading cases and also in chronic cases salicin gr. 10 t.i.d. is much more likely to do good than arsenic. Alkalies such as pot. citrat. gr. 15, together with mag. carb. gr. 5 t.i.d., are also sometimes useful. The reason for giving alkalies is based on the theory that in psoriasis the skin is too acid. From analogy with seborrhœic conditions, which are somewhat allied to psoriasis, there is some evidence that the skin is more acid than normal. The acne bacillus, which many believe to be identical with the seborrhœa bacillus, will only grow outside the body in an acid medium. Assuming that the skin is more acid than normal in psoriasis, that would explain why some individuals get psoriasis, and others, with less acid skins, do not. It is possible that in psoriasis there is a bowel infection with fermentation and the production of acid. Dieting should be tried in all cases. Psoriasis is certainly not due to any particular food, but good results may sometimes be obtained by cutting out or cutting down certain groups of foods, such as sugars, starches, meats, fats, and acid fruits. Each group should be cut down to the minimum in rotation. If an improvement is going to take place it will show itself within ten days or so. If this form of dieting produces no results, sending the patient to one of the spas, such as Harrogate, to get the bowel thoroughly cleared out does good in some cases. Drinking the waters alone is not usually sufficient; the lower bowel should be washed out by the Plombières douche. Vaccines made from the bowel contents have also been tried, but the results are usually disappointing.

Non-specific Protein Therapy.—In cases where all the above methods fail to give relief non-specific protein therapy may be tried. For this purpose sera, peptone, and sterilised milk have been chiefly used. Of the three, sterilised milk is the one to be recommended. If a foreign serum is used, such as horse serum, there is always the risk, although perhaps not a very great one, of anaphylactic shock reactions, and if the patient's own serum is used there is the difficulty of the technique which is and when these were omitted the coefficients became very small.

Effect of Low Temperature combined with Fog.



Having so far failed to trace any decided association between the prevalence of fog and an increased mortality from respiratory disease, it remained to investigate if fog required the conjunction of some other meteorological factor to produce an increase in the number of the weekly deaths. A graph (Diagram I.) was made of the average of the data in Table II., to which was added the average weekly amount of rain and the average weekly temperature prevailing throughout the 27 years. A reading of the diagram seemed to suggest that the conjoined effect of a low temperature and the prevalence of fog determined the increase in the deaths, particularly among adults. To test this point further, graphs were drawn for the individual years, and this characteristic was clearly confirmed. It was seen that in the same week with the advent of fog there was a large increase in the number of deaths, while at other times there was no material excess of mortality. An explanation of the phenomenon was afforded by the readings of the temperature curves. Whenever the prevalence of fog was associated with a depression in the temperature, then there was a rapid increase in the number of adult deaths, while in the absence of this decline no perceptible movement in the mortality curve took place. To illustrate this fact, Diagrams II., III., and IV. of the weekly deaths among children and adults, with the temperature, rainfall, and the amount of fog, are submitted for certain years. Diagram II. shows that there were three peaks in the mortality curves for the period October, 1874, to March, 1875, particularly defined in the case of the adults and, to a much less degree, in the case of the children, and that at each occurrence they were preceded by a low temperature and fog. On the other hand, in Diagram III., it will be clearly observed that the temperature between October, 1883, and March, 1884, was seldom below 40°, and that there was little oscillation in the number of deaths. The weather records for this winter contain the following details :—

1. Week Ending Nov. 3rd.

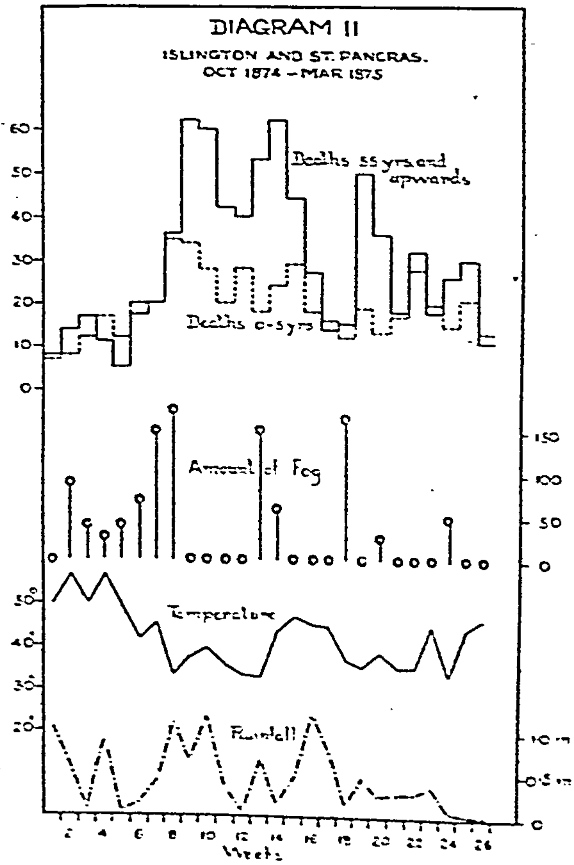
Explanatory Notes.

			9 A.M.		9 P.M.
Oct.	28th	.. Dense fog, 11 A.M.; fog in evening	ff.	..	Ov.
,,	29th	.. Foggy morning	Fog.	..	Fine.
,,	30th	.. Fair day, colder	,,	..	,,
,,	31st	.. Dull and cold	..	..	Ov.
Nov.	2nd	.. Foggy, dark morning	,,	..	,,

2. Week Ending Dec. 29th.

Dec.	24th	.. Fog in the morning	Fog.	..	Ov.
,,	25th	.. Foggy, dull, damp, and mild ..	,,	..	,,
,,	26th	.. Foggy, dull, but cooler	,,	..	,,
,,	27th	.. Fog all day	,,	..	Misty.
,,	29th	.. Overcast	,,	..	Ov.

ff. = very foggy. Ov. = overcast.



From these details it must be inferred that fog was fairly prevalent during the weeks in question, but, as will be seen from the diagram, it had a minimal effect on the deaths, any adverse influence it was likely to have being apparently counteracted by the high temperature prevailing. Diagram IV. is particularly interesting. Although the respiratory mortality after 1890 is largely associated with the prevalence of influenza, there was no epidemic of influenza from October, 1892, to March, 1893, as the weekly deaths in London as a whole were very low. Consequently, the respiratory deaths in this year may be safely regarded as non-influenzal. It will be observed from the diagram that there were two weeks characterised by a high prevalence of fog, one, the week ending Nov. 12th, and the other, the week ending Dec. 31st. The deaths among the children and adults were uninfluenced by the November fog, during which the temperature was over 44°, but after that in December, when the temperature fell to 27°, there was a rapid increase in the number of deaths among adults, with no corresponding excess among the children. As will be seen from the weather been analysed. Such is the object of the present paper.

Conditions of the Investigation.

For the purpose of the investigation, the area selected was that comprising the boroughs of Islington and St. Pancras, which contain in the aggregate a population of about 500,000 people. These districts are contiguous to Camden-square where the observations on fog were made, and they may also be regarded as experiencing the same weather conditions as the Regent's Park area, a good illustration of a fog-bound locality. The registers containing the fog and other weather records were deposited in the offices of the Royal Meteorological Society and access was kindly given to them. The records taken at 9 A.M. and 9 P.M. each day, together with the explanatory notes which described more fully the weather conditions prevailing throughout the day were abstracted from the registers for the six months, Oct. 1st to March 31st. It was deemed advisable to limit the investigation to the winter months as this is the period of the year when fog is usually prevalent. The records were extracted for a period of 30 years, but the data of only 27 years were utilised in the analysis owing to the fact that influenza became epidemic after 1890, and between that year and 1900 there were three outbursts—viz., 1892, 1894, and 1899. Accordingly, the excess number of respiratory deaths occurring in those years could not be differentiated from the complications arising out of the epidemics. For this reason these years were omitted. When the abstractions were completed the records were classified. Where it was stated that fog prevailed at 9 A.M. and at 9 P.M. and the explanatory notes indicated fog present throughout the day, the amount of fog for that particular day was represented by 100. Fog in the morning and lasting until noon was standardised as 50, due regard being given to the duration and intensity. A series of comparative figures of the daily amount of fog were thus obtained. The totals for the days were summed for each week and the sum taken as representing the amount of the fog during the week. These assessments can only be regarded as approximations, but they probably stand for a fair representation of the facts. The daily readings of temperature and rainfall were also taken out and reduced to weeks.

By the kindness of the Registrar-General, the registers containing the daily deaths occurring in the two boroughs for the period in question were placed at my disposal, and from them the respiratory deaths among children aged 0–5 years, and among adults aged 55 years and upwards, were extracted and tabulated in weeks. The analysis was confined to these periods of life as the mortality occurring at these ages embraces 70 per cent. of the total deaths from respiratory diseases. All deaths among children that could be regarded as complications of an infectious disease were excluded. A correction was then made for increase of population. This correction was most essential from a correlation standpoint, as otherwise, towards the end of the period under review, there would be a large number of weekly deaths as compared with those of the early years which would be due solely to the increased population from which they were derived, irrespective of any adverse influence fog may have had. The deaths for both children and adults were then written out in rows of 26 weeks—the period October to March—for the series of 27 years and summed. The totals revealed certain interesting features. The trend of the deaths among children is altogether different from that among adults. The graph of the former starts from a minimum in October and reaches its maximum in the last week of November, and then falls to what is practically a fixed level for the remaining weeks. On the other hand, the curve for adults, like that for the children, starts at a minimum but goes on increasing, with the exception of a very slight depression in the fourth week of December, and attains its maximum in the first or second week of January.

The Potency of Fog as a Factor in Increasing Respiratory Death-rate.

Having at my disposal the weekly amount of fog, the temperature, the rainfall, and the number of respiratory deaths both among children and adults, I was in a position to test the validity of the claim that fog is a potent factor in producing the increase in the respiratory death-rate. If fog has the alleged destructive effect, then, if no other disturbing factors existed, years containing many foggy days should show a large increase in the number of deaths as compared with those years when fog was less frequent. To test this point, the respiratory deaths among adults in each week from October to March and likewise the amount of fog were totalled for each of the 27 years. The correlation coefficient was then calculated for the amount of fog and the deaths at age 55 years and upwards for the series of 27 years and was found to be +0·441. This coefficient would appear to indicate that, as regards adults, there is an association between the amount of fog in any one year and the respiratory deaths, but, as will be shown later by diagrams, the coefficient is really evidence, not of a relationship between the amount of fog in any one year and the corresponding excess of deaths, but of the combined effect of fog and a low temperature on the respiratory death-rate.

The next point of interest to discuss was at what period of the winter fog produced its greatest effect on the respiratory deaths. For this purpose a table (Table II.) was made of the total deaths among children and adults and the amount of fog in each week of the year for the whole series of the 27 years. From this table it might be inferred that the maximum deaths among children was caused by the November fogs, and the increase among adults by the heavy fogs in December. To verify this, the correlation coefficients were calculated between (1) the amount of fog in the second week of November, the week of maximum fog in this month, and the number of deaths among children in the fourth week of November, the week of maximum deaths age 0–5, for the series of 27 years, and found to be −0·116, and (2) the amount of fog in the third week of December and the number of deaths among adults three weeks later, and found to be −0·066. The size and sign of these coefficients show that the period of maximum fog had no connexion with the causation of the maximum deaths.

Table II.—*Showing the Total Number of Deaths from Respiratory Disease among Children and Adults, with the Amount of Fog, in each Week from October to March for 27 Years, Beginning at 1870.*

Weeks.	Total deaths among—		Total amount of fog.	Weeks.	Total deaths among—		Total amount of fog.
	Children.	Adults.			Children.	Adults.	
1	264	270	630	14	433	1026	2130
2	331	301	1290	15	440	1033	1985
3	391	319	2050	16	427	920	1775
4	482	414	1700	17	407	845	2110
5	484	463	1610	18	424	849	1735
6	538	489	2580	19	456	1002	2005
7	572	481	2050	20	444	779	1143
8	613	604	2045	21	450	693	1005
9	492	619	1395	22	467	725	1285
10	493	647	925	23	471	727	610
11	480	749	3775	24	433	724	1030
12	508	720	2120	25	457	695	705
13	463	911	2535	26	372	527	180

It now remained to discover the general relationship between the amount of fog and the respiratory deaths in any one week. Accordingly, the amount of fog in each week of the year for the whole series of the 27 years was correlated with the respiratory deaths in the same week and in the subsequent week for both children and adults. In some cases fairly high correlation coefficients were obtained, but they were largely due to one or two observations in the series

Diagram III. and the first section of Diagram IV., where it is shown that although fog was rather prevalent there was no increase in the number of the deaths.

2. That if the prevalence of fog is associated with a low temperature and frost, the respiratory death-rate of adults can be influenced very considerably, although the effect is not evident in the case of children. This is illustrated by Diagram II. and the end of Diagram IV., and confirms the conclusions of the late Dr. Russell, of Glasgow, who maintained that "during winter every city was in danger of a catastrophe if certain weather conditions occurred, a combination of frost, fog, and still air for days together." It is also supported by the evidence of Table I., which Councillor Smith constructed for Glasgow.

NICKEL COOKING VESSELS.

ALTHOUGH pure nickel cooking vessels have not yet come into extended use, they have many obvious advantages. Pure nickel is very resistant to corrosion and takes a high polish which is readily retained. It is quite unattacked by soda, and even dilute hydrochloric and sulphuric acids have no appreciable action during a short time. These properties make it an easy matter to keep nickel cooking vessels scrupulously clean: grease may be removed with soda, and calcareous deposits from hard water may be removed by dilute hydrochloric acid. The crucial question, however, is whether foods cooked in nickel vessels can be contaminated with nickel in sufficient quantities to be in the least injurious when consumed regularly over prolonged periods. Nickel is usually regarded as one of the less toxic heavy metals such as iron and aluminium, rather than one of the more toxic group such as copper, lead, and mercury, and extensive investigations which have been made in foreign countries, notably Austria and Russia, have shown that this view is justified, and that no danger is likely to arise from the use of nickel cooking vessels.

Rohde[1] cooked fruits in nickel vessels, and could discover no ill-effects when these were eaten. These results were confirmed and amplified by Ludwig,[2] who cooked the food of a large household in nickel vessels for two and a half years and determined the amount of nickel in the different foods. The household consisted of nine or ten persons of ages 6–56, and none of them experienced the slightest ill-effects. The vessels used by Ludwig contained 98 per cent. of nickel, with traces of copper, iron, manganese, aluminium, and cobalt. A more elaborate investigation comprising pharmacological, chemical, and culinary experiments was published by Dzerzgowsky and Schumoff-Sieber in 1906.[3] Dogs were given daily doses of nickel sulphate equivalent to 5 to 10 mg. of metallic nickel per day for 200–220 days without any ill-effects being observed. At the end of the period, in which a total of 10–25 g. of metallic nickel had been given, no nickel was found in the organism, showing that no absorption takes place from the stomach and intestines. Repeated daily doses of as much as 0·5 g. of nickel sulphate were found to be harmless to a dog of 9 kg., corresponding to 0·70 g. of metallic nickel per day for a man of 70 kg. The foods cooked by them contained from 0·2 mg. nickel to 23 mg. per kg. in the case of very acid foods (Table I.), and this would introduce very much less than the above-mentioned tolerable amount. The amount of nickel dissolved by foods was found to be roughly proportional to the acidity and to the time of cooking. Elaborate tables are given showing the effects on nickel vessels of solutions of acetic, oxalic, butyric, lactic, and tartaric acids, both alone and in conjunction with common salt. Salt increases the amount of nickel dissolved by the organic acids. For example, 4 litres of 0·3 per cent. acetic acid boiled for three hours dissolved 0·0047 per cent. of nickel, and the same with the addition of 5 per cent. salt dissolved 0·0137 per cent. of nickel. If these were allowed to stand in the nickel saucepans for 11 hours after the three hours' boiling, the amounts of dissolved nickel were increased to 0·0203 per cent. and 0·0361 per cent. respectively. The area of nickel exposed to the acids in these experiments was 1209 square cm.

TABLE I.—*Milligrammes Nickel per kilogramme Food.*

—	I.	II.	III.	IV.
Water and tea	—	—	0·2	—
Water, salt water, meat extract and milk.. ..	—	3·5–5·3	—	—
Milk	v. s. tr.	—	—	—
Coffee	—	—	—	0·03
Gruel	—	—	3·1	—
Boiled beef	9·0	—	—	—
,, venison	19·0	—	—	—
,, peas	12–16	—	—	—
Beef and bouillon	—	26–64	—	—
Potato soup..	—	—	10·9	—
,, pulp	—	26–40	—	—
Beetroot	11·6	—	10·6	—
Spinach	26	22·4	—	—
Sorrel	129	—	23	—
Boiled lentils	24	—	—	—
,, ,, with vinegar .	35	—	—	—
Sauerkraut	54–129	18–57	—	127
Boiled plums	35	—	—	—
,, damsons and plums	—	13·3	—	—
Fruit boiled with 2 per cent. acetic acid	—	65–67	—	—
Apple compôte	—	—	—	46·0
Potatoes fried in butter ..	—	—	—	79·8
Veal cutlet	tr.	—	—	—
Lamb	tr.	—	—	—
Fried chicken	tr.	—	—	—
Sauerkraut cooked with lard	—	—	—	121·3
Savoy cabbage	—	—	—	83

I., Ludwig; II., Lehmann; III., Dzerzgowsky and Schumoff-Sieber; IV., Normann and Hugel. v. s. tr. = very small trace.

Similar exhaustive experiments were subsequently published by Lehmann,[4] who also concluded that nickel cooking vessels were absolutely safe and hygienic. The same conclusion that nickel vessels were safe and suitable for cooking was reached by Normann and Hugel in 1913,[5] although these investigators found a rather higher proportion of nickel in most of the foods cooked by them. The quantities of nickel found by foreign investigators are summarised in Table I.

A search of the literature has failed to reveal any real evidence on the other side. The only case recorded where poisoning is attributed to metallic nickel in food or drink is one described by Faichnie and Langrish,[6] in which barley-water and lime-juice mixed stored in a large metal urn for a day produced sickness and vomiting. The urn was not of nickel, but of white metal coated with nickel, and although it is stated that analysis of the drink showed the presence of nickel, no quantity is mentioned, and no details are given. The poisoning may have been due to other metals such as copper. This occurrence took place in India during the hot season.

The degree of purity of the nickel vessels used by the previously quoted Continental investigators is not stated except by Ludwig, and the nickel cooking vessels made in this country are considerably purer than his. A specimen supplied to us, manufactured by Messrs. Joseph Sankey and Son, of Bilston, had the composition:—Nickel, 99·31 per cent.; iron, 0·44 per cent.; magnesium, 0·11 per cent.; carbon, 0·06 per cent.; copper, 0·05 per cent.; silicon, 0·03 per cent.; and experiments were made to see how the purer nickel behaved in comparison with that used by other investigators. In general, the results obtained with water, acetic acid, salt, &c., are similar to those of Dzerzgowsky and Schumoff-Sieber, but the records for the period, there was a greater amount of fog prevalent in the week ending Nov. 12th.

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[1] Archiv f. Hyg., [illegible], xx., 231–[illegible].

[2] Oest. Chem. Ztg., [illegible], I., 2.

[3] [illegible] Ztschr., [illegible], 199–218.

[4] Archiv für Hygiene, 19[illegible], lxviii., 421.

[5] Chemiker Ztg., xxxvii., 415; Seifen Ztg., 1913, [illegible].

[6] Jour. R.A.M.C., 1910, xv., [illegible].

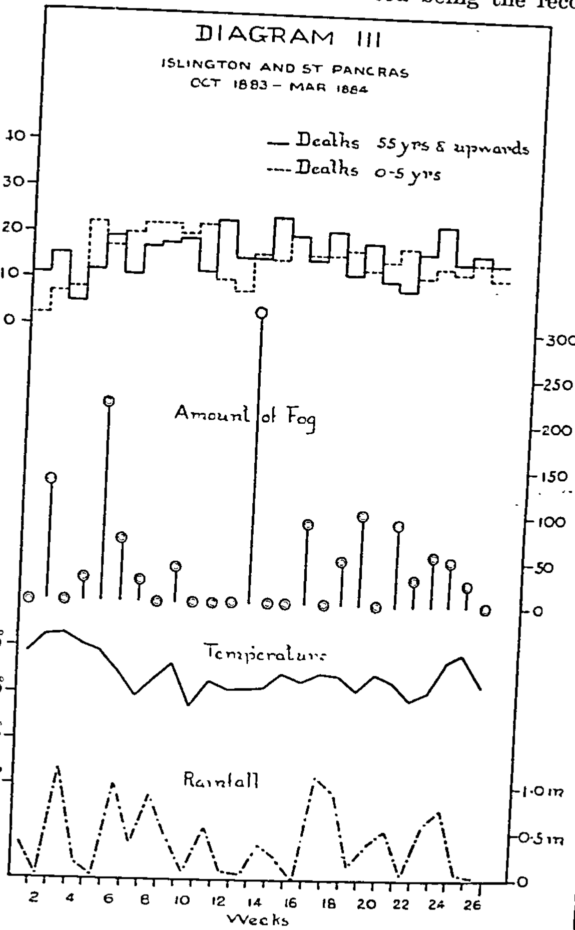
Week Ending Nov. 12th.

			9 A.M.		9 P.M.
Nov.	7th	.. Misty early, foggy towards evening and sunset	Fog.	..	Fog.
,,	8th	.. Fog more or less all day	,,	..	Ov.
,,	9th	.. Slight fog till 10 A.M.	Ov.	..	,,
,,	10th	.. Fog more or less all day, dense at times in the morning ..	Fog.	..	Fog.
,,	11th	.. Overcast throughout..	,,	..	Ov.
,,	12th	.. Clear at times, but very dark with high fog	Sl. fog.	..	,,

Week Ending Dec. 31st.

Dec.	27th	.. Rather dense fog in morning, clear after 1.30 P.M.	Fog.	..	Fine.
,,	28th	.. Fog all day; dense in morning and evening	,,	..	Fog.
,,	29th	.. Fog generally dense till 11.30, cleared suddenly, came on dense again at 1 P.M. ..	,,	..	Fair.
,,	30th	.. Fair, but slight fog in morning.	Sl. fog.	..	,,

To see if similar characteristics were present, the figures for London as a whole were graphed for the same year, the weather data used being the records



taken at Greenwich. The deaths in the case of the adults were from age 60 and upwards, as the weekly returns issued by the Registrar-General did not give the number at age 55. The two diagrams were identical—no excess of deaths after the fog in November when a high temperature prevailed, and a large excess among the adults in December following the low temperature and prevalence of fog. The Greenwich weather records are an interesting study for these weeks and are given in detail.

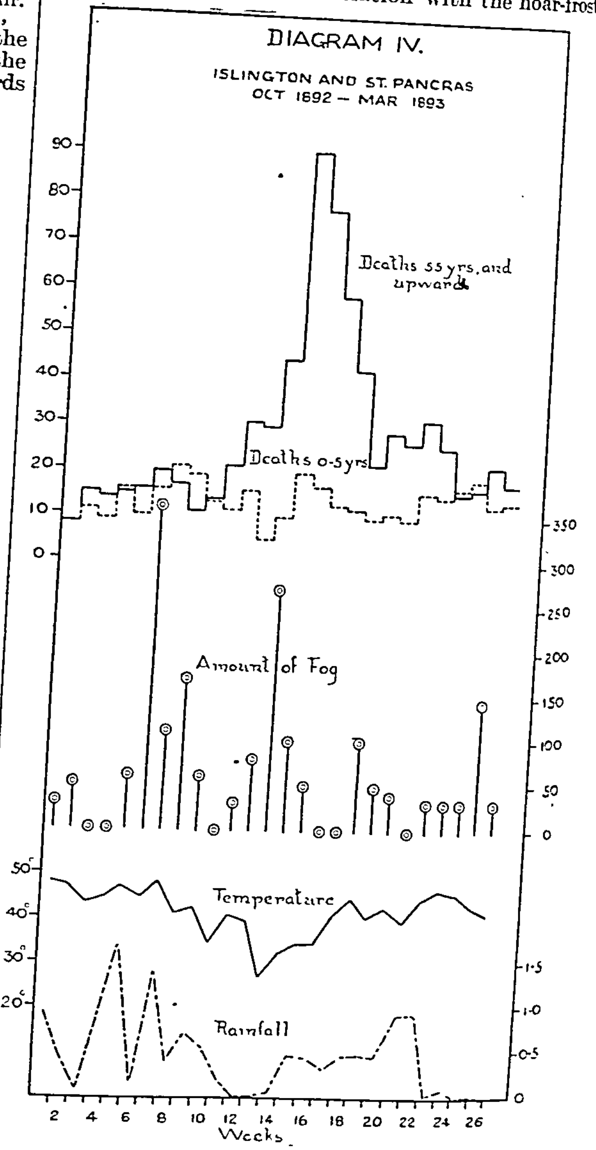
Week Ending Nov. 12th.

Nov. 7th .. Hoar-frost in the morning, generally cloudless, very foggy throughout the day.
,, 8th .. Dense fog throughout the morning.
,, 9th .. Overcast till evening, variable clouds, slightly foggy.
,, 10th .. Foggy in morning, overcast and foggy at night.
,, 11th .. Overcast, variable fog, occasional fine rain.
,, 12th .. Fog and rain in morning, fine for a short time in the afternoon.

Week Ending Dec. 31st.

Dec. 27th .. Variable clouds, fog and hoar frost, very cold day.
,, 28th .. Overcast, dense fog prevailed throughout, very cold.
,, 29th .. Fine, with variable amounts of cloud, slight fog in the morning and night; cold.
,, 30th .. Dense fog prevailed throughout the morning. Hoar-frost, very cold.

It is noteworthy that in the weather records for the week ending Dec. 31st there is frequent mention of the presence of hoar-frost. In February, 1880, when there was a great outburst of respiratory deaths both among adults and children in London as a whole, but confined to adults in the St. Pancras and Islington area, the prevalence of hoar-frost, low temperature, and fog are again mentioned in the Greenwich records. Whether the fog, in association with the hoar-frost, caused the increase in the number of deaths cannot be definitely determined. Much the more likely assumption is that the deciding influence was the conjoint effect of fog and low temperature and that the prevalence of hoar-frost was a mere indication of the decline in temperature.



Conclusions.

From the analysis of the present data there seems sufficient evidence to warrant the following conclusions:—

1. That fog itself has no appreciable effect on the respiratory death-rate, as will be observed from

Colonial List of the Medical Register, the Council had been informed that reciprocity would lapse on any refusal to register a class of practitioners whose names appeared on the Medical Register of the United Kingdom.

Colonel R. A. Needham, officially appointed to inspect Indian Universities and Colleges of Medicine, having been refused admission to the final examinations of Calcutta University, the University authorities had been informed that, in the absence of a report on these examinations, recognition by the G.M.C. of the medical degrees of that University would cease on Nov. 30th next.

In regard to the proposed Articles of Association of the Society of Radiographers, the Committee resolved to inform the Board of Trade of their strong objection to the last paragraph in Article 27 which proposed to entrust to an unqualified person the duty on his own responsibility of making and reporting a diagnosis of disease or injury to patients or others.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. A. A. Seeds retires on ret. pay.

Capts. to be Majs.: R. B. Price (Prov.), J. B. A. Wigmore (Prov.), J. Hare (Prov.), R. A. Flood (Prov.), E. C. Lang (Prov.), L. T. Poole (Prov.), C. C. Jones (Prov.), E. V. Whitby, E. U. Russell (Prov.), R. G. Shaw, N. T. Whitehead (and remains secd.), J. C. Sproule (Prov.), A. F. C. Martyn, G. F. Allison (Prov.), R. C. Carlyle (Prov.) (and remains secd.), A. A. M. Davies, Bt. Maj. L. Dunbar, and Bt. Maj. H. F. Panton (Prov.).

Capt. J. E. Brooks is restd. to the estabt.

Capt. J. W. Cannon retires receiving a gratuity.

Lt. M. A. Graham-Yooll is restd. to the estabt.

TERRITORIAL ARMY.

G. H. R. Gibson (late Canadian Army Med. Corps) to be Captain; W. M. Farr, J. J. Mitchell, I. Morgan, and F. A. Smorfitt to be Lts.; Hon. Lt. O. F. W. Robinson to be Lt.

DEATHS IN THE SERVICES.

We regret to announce the death of Colonel Reginald James Cope Cottell, C.B.E., R.A.M.C., on August 7th, after a prolonged illness borne with cheerful fortitude. The fourth son of Major James William Cottell, H.E.I.C.S., he was born at Rodborough, Gloucestershire, in October, 1858. He studied medicine at St. George's Hospital and obtained the Membership of the Royal College of Surgeons of England in 1886, having in the previous year become a Licentiate of the Society of Apothecaries. Immediately after qualifying he obtained a commission in the Royal Army Medical Corps and was subsequently stationed in Natal. He served throughout the South African War, 1899–1902, and received for his services the Queen's Medal and the King's Medal, both with three clasps. After serving in the Mediterranean he was appointed in 1906 assistant surgeon to the Royal Hospital, Chelsea, and some four years later physician and surgeon, positions which he held for three years. On the outbreak of the war he was put in charge of the recruiting stations in London and from 1915 to 1919 was commandant of King George's Hospital. In 1918 he was made a Knight of Grace of the Order of St. John of Jerusalem and in 1919 was awarded the C.B.E. (Military). He also received the rank of Brevet-Colonel. Colonel Cottell, who leaves a widow and three daughters, possessed a high sense of duty and was a very popular and competent officer.

GOVERNMENT publications on health matters are not yet as readily accessible at H.M. Stationery Office as they might be. Application for the Interim Report on Preservatives in Food, noticed in another column, was met by the statement that it was "not yet out." Application for Circular 1337 of the Board of Education dealing with the closure of schools during epidemics, and giving the consensus of medical opinion on this practice, was met by the rejoinder "not on sale." Application for the white paper on the Cost of Health Services, issued a week or two ago, elicited the statement that the document was "out of print." Whether too early, or too late, or ineligible, the inquirer may be prevented from satisfying laudable curiosity about matters of great moment to the health of the community. The attempt to purchase the publications was made on Tuesday morning, August 12th.

Medicine and the Law.

The Payment of Witness Fees to Medical Officers.

AT the last meeting before the summer recess the London County Council reached an important decision regarding the fees payable to medical officers of asylums, hospitals, and institutions for performing post-mortem examinations and giving evidence at coroners' inquests. Shortly expressed, the decision of the Council is to abolish payment altogether.

Section 22 of the Coroners Act, 1887, provides for payment of a fee of 2 guineas to private practitioners in this connexion. Under Subsection 2, however, no fee is payable when the deceased has died in a "county or other lunatic asylum, or in a public hospital, infirmary, or other medical institution," whether supported by endowments or by voluntary subscriptions. Notwithstanding this provision, fees have not been withheld from medical officers of workhouses and Poor-law institutions, but the attention of the L.C.C. has been directed to the question by a district auditor, who recently took exception to certain witness fees paid to medical officers of hospitals controlled by the Metropolitan Asylums Board. One such medical officer, on being asked to refund the fee, refused to do so, and the Public Control Committee took the view that it was "inequitable that a medical officer who happened to be employed in a certain type of publicly maintained institution should be receiving a fee, whereas another medical officer performing analogous duties and practically in a similar position should not be so paid." The Minister of Health was consulted by the Council, but declined to express any opinion on the matter. The district auditor on June 16th drew the Council's attention to the fact that, on the advice of eminent counsel, Poor-law union infirmaries had not hitherto been regarded as coming within the prohibition of the Act. He pointed out, however, that in recent years the character of these infirmaries had undergone a considerable change, and that in many instances they were in no way inferior to the best general hospitals. He had, therefore, decided that inquest fees were not payable to medical officers of "hospitals controlled by the Metropolitan Asylums Board, Poor-law infirmaries, general infirmaries, prisons, or other medical institutions of a public character." In his opinion such payments, if made, were illegal and an improper charge on the Council's funds. The London County Council has accepted this ruling and fixed Sept. 1st next as the date of discontinuance of the payments. The resolution passed by the Council was in the following terms:—

> "That, as from 1st September, 1924, the payment to medical officers of hospitals controlled by the Metropolitan Asylums Board, workhouses, Poor-law infirmaries, prisons, and other medical institutions of a public character, of fees under Section 22 of the Coroners Act, 1887, for making post-mortem examinations and giving evidence at inquests held in the County of London be discontinued."

The Home Secretary's Decision in Cases of Murder.

The Right Hon. Edward Shortt, who has had experience of the responsibility of the Home Secretary in granting or withholding reprieves, where murderers have been sentenced to death, contributed recently to the *Daily Express* an article recommending that the procedure should be altered and that the final decision on such occasions should rest with a committee. Probably the duty, which in the present circumstances the Home Secretary performs alone, is one of which most men would gladly be relieved, and the suggestion that a committee should undertake it is not a new one, and is quite likely some day to be considered by Parliament. Mr. Shortt, however, has made a definite proposal that the committee should be composed of the foods cooked showed less nickel dissolved in them than in the case of the continental experiments. Results are summarised in Table II., and it will be seen that the quantities of nickel found are quite without significance, even in the case of such an acid food as rhubarb. Onions were cooked to see whether the large proportion of sulphur contained in them caused any blackening through the formation of nickel sulphide. The onions themselves were not stained at all, but the saucepan showed a slight brown discoloration of nickel sulphide, which was easily removed.

TABLE II.—*British Pure Nickel Cooking Vessels.*

Material boiled or cooked in the nickel vessel.	Time of boiling in hours.	Mg. nickel per kg. of material.	Mg. nickel dissolved per sq. decimetre of surface.
Decinormal sodium carbonate	1	0	0
London tap water	2	0	0
Distilled water	1	0·2	0·03
0·8 per cent. NaCl	1	0·9	0·23
0·1 per cent. acetic acid with 2 per cent. NaCl	1½	21·0	5·94
0·3 per cent. acetic acid with 0·8 per cent. NaCl ..	1	22·4	4·68
1 per cent. citric acid ..	1	45·0	9·4
4 per cent. acetic acid ..	1	260·0	54·1
Rhubarb	¾	4·0	0·60
Stewed lamb	1½*	v. sl. tr.	—
Boiled broad beans	½	0	0
Potatoes fried in lard ..	—	0	0
Lard fried alone	—	0	0

* Left in nickel saucepan overnight. v. sl. tr.—Very slight trace.

These pure nickel vessels are therefore eminently suitable from the point of view of metallic contamination of the food, and quite equal to those made of aluminium in this respect. They are superior to aluminium with regard to cleanliness. They remain quite bright if left filled with water for several days, whereas aluminium is liable to become partially coated with spongy oxide. Calcareous deposits may be removed by dilute hydrochloric acid, without any nickel being dissolved. This was proved by etching some of the nickel with nitric acid and then soaking it for a quarter of an hour in 2 × normal hydrochloric acid, when no trace of nickel could be found in solution. Pure nickel therefore appears to be the ideal material for cooking vessels from the hygienic point of view, its only drawback being its high first cost, though this may be offset by its extreme durability, in which respect it is probably far superior to any other material used for this purpose.

Similar nickel utensils to the sample experimented with are manufactured by Messrs. Joseph Sankey and Sons from sheets made of pure Mond nickel, guaranteed over 99 per cent., and are produced by Henry Wiggin and Co., Ltd., 55. George-street Parade, Birmingham.

INTERNATIONAL DENTAL FEDERATION.

A MEETING of the International Dental Federation was held in the city of Luxemburg on August 3rd, 4th, and 5th, and was attended by delegates from numerous dental associations in various parts of the world. The proceedings opened in the town hall under the presidency of the Minister of Education, Director-General Herr Nevens, who welcomed the delegates to Luxemburg and wished them a most successful conference. Among the delegates who spoke were: Mr. Blatter (Paris), Herr Schäeffer-Stuckert (Frankfort-on-Main), Dr. G. Bandoux (Brussels), Dr. G. Griepeschock (Riga), Dr. Friesell (Pittsburgh, U.S.A.), and Mr. W. B. Paterson (London).

Mr. Paterson remarked upon the reappearance of a spirit of fraternity exhibited in the speeches of the delegates. He believed that it was the first time since the war that such an amicable disposition had been shown in any meeting, whether dental or medical.

Dr. Truman W. Brophy (Chicago), President of the Federation, thanked the Minister and the other speakers, and desired that a message expressive of the grateful thanks of the meeting might be conveyed to the Grand Duchess of Luxemburg for her patronage. The programme of the meeting was afterwards discussed in detail in the various commissions appointed.

The Hygiene Commission reported the general and increasing prevalence of dental caries throughout the civilised countries of the world. All the delegates present were unanimous upon that point.

Upon that report the Federation advised the desirability of establishing a dental department under a dental controller in the Ministries of Health of all countries. Only two or three countries had adopted this course so far.

The Commission on Documentation reported that it had established at the Palais Mondial, Brussels, a catalogue of all the important works and papers on dental subjects, extending back for a period of over 17 years. Copies or references could be obtained for a nominal sum by letter addressed to the director.

The relief fund for Russian dentists had been distributed in 1923 by Dr. Florestan Aguilar (Madrid) on behalf of the International Dental Federation. Leningrad (Petrograd), Moscow, and Odessa had been visited for that purpose, and 260 complete outfits of dental instruments had been distributed. Dr. Griepeschock (Riga), who had been imprisoned by the Bolsheviks, described the gratitude shown by Russian dentists for these valuable gifts.

Questions relating to the organisation of the next or seventh International Dental Congress, at which a membership of over 8000 members was expected, were brought forward by Dr. King (Chicago), the general secretary of the Congress, and were replied to by Dr. W. Guy (Edinburgh), Prof. W. H. Gilmour (Liverpool), and Dr. Georges Villain (Paris).

The award of the Miller Memorial Prize for important work in connexion with dentistry was made to Dr. Brophy, dean of the Chicago Dental School, Mr. J. Howard Mummery (London) announced the result of the ballot for the prize, and congratulated the recipient.

The next meeting of the International Dental Federation was fixed to take place in Geneva on August 5th and two following days in 1925 at the invitation of the Swiss National Dental Association.

GENERAL MEDICAL COUNCIL.

MEETING OF EXECUTIVE COMMITTEE, JULY 28TH.

THE Committee was officially notified of the re-appointment of Dr. David Hepburn as representative of the University of Wales for one year from July 16th, 1924, and of Dr. Arthur Thomson as representative of the University of Oxford for five years from June 21st, 1924.

Notice was taken of the restoration to the Medical Register—the prescribed conditions having been duly fulfilled—of the following names erased in conformity with Section XIV. of the Medical Act, 1858:—

Dawson, Thomas (S.)
Harmar, Mary (S.)
Hill, Arthur R. (S.)
Hillier, Sidney (S.)
Orr, Andrew W. (I.)
Raitt, Oswald (S.)
Russell, Wilfred A.
Thompson, Thomas R. S. (I.)
Tough, James B. K. (S.)
Woo, Arthur W.

the names with the bracketed affixes (S.) and (I.) having been sent for restoration by the Scottish and Irish Branch Registrars respectively.

Sir Nestor Tirard was appointed to attend a conference at the Ministry of Health of representatives of Departments and bodies concerned, in anticipation of the International Conference for the Unification of Drastic Drugs to be held in 1925 at Brussels.

In regard to the refusal of the Council of Physicians and Surgeons of New Brunswick to register in that province an applicant whose name appeared upon the

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(*Continued from p. 296.*)

SECTION OF SURGERY.

WEDNESDAY, JULY 23RD.

ON the first day, Sir CUTHBERT WALLACE, the President, being in the chair, a discussion on

Acute Osteomyelitis

was opened by Mr. JOHN FRASER (Edinburgh). He began by pointing out the confusion which exists as to anatomical terms in relation to the structure of the bones, and defined the metaphysis as that portion of the diaphysis which lies adjacent to the epiphyseal cartilage. He said: The metaphysis is the site during the years of growth of the most intense cell activity and is the most vascular area of the bone. It is the site of origin of most of the inflammatory diseases of the bones, and in particular of acute osteomyelitis. This is essentially an infective process in the interior of the bone, the endosteum and the marrow being first affected. It is only at a later stage that the infection spreads through the bone and involves the periosteum. A primary periostitis is extremely rare. Acute osteomyelitis is then the result of an acute pyogenic infection of the metaphysis, and it is essentially an affection of the age of growth. In the vast majority of cases the infection is blood-borne, and this presupposes a mild form of septicæmia. That such a septicæmia occurs, and indeed is common in young children, the recent work of Lipschitz shows. The source may be any septic focus, in the teeth, tonsils, sinuses, or skin for example, or pneumonia and the exanthemata. An important source is the umbilicus, and Mr. Fraser referred to a series of 30 cases in young infants which he had collected in the last four years, all of them fatal. In his opinion umbilical infection is a common origin of obscure blood infection in infancy, the infection sometimes persisting until the years of later childhood. The disease tends to be localised in certain special sites, and in order of frequency these are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and the upper end of the humerus. Slight trauma is probably an important factor in causation, and this would explain the high proportion of cases in boys and in the lower limbs, but the trauma must be slight, probably resulting only in a small metaphyseal hæmorrhage. The large metaphyseal surfaces seem to be more readily affected than the small. Boys are affected more often than girls in the proportion of 6 to 1, and the eighth to the twelfth year is the period in which the disease is most common. In a series of 400 cases the responsible organism was the *Staphylococcus aureus* in 78 per cent., the pneumococcus in 11 per cent., and the streptococcus in 6 per cent. The number of cases of pneumococcal infection was an important point to be discussed later.

The disease starts in the metaphysis with an intense primary infection of the medulla. The inflammatory products are under extreme tension, and this accounts for the intensity of the local symptoms and the severity of the toxæmia which results. From the point of view of prognosis this is the most dangerous stage, for it is now that septicæmia in an acute form is most likely to occur. The second stage is evidenced by a spread of the infection from the interior of the bone into the subperiosteal area. The vessels and spaces of the Haversian canals are the routes along which the migration occurs, and a serous subperiosteal effusion is followed by a purulent one. With the relief of tension the symptoms abate and the prognosis improves. The facility with which the second stage can be established will depend on the number of the Haversian canals and the porosity of the bone, and the density of the femur may account for the severity of the symptoms associated with infections of this bone. The greater porosity of the tibia and the humerus makes it easier for the products of inflammation to escape from the interior of the bone. The third stage is that of reaction. The osteoblasts in the deeper layers of the periosteum proliferate, an involucrum is laid down, and the dead portion of the diaphysis is separated by the active phagocytic action of the granulation tissue which is formed.

The *clinical features* are intense and distinctive. There is the agonising pain of the early stage while the infection is still locked up under tension in the interior of the bone. It is during this stage that the signs of toxæmia—the high temperature, the delirium, the poisoned appearance—are greatest. It is at this stage that a massive invasion of the blood-stream may inaugurate a septicæmia which by its intensity overshadows the local signs. With the relief of tension which characterises the stage of subperiosteal effusion there is an immediate abatement of signs and symptoms, the pain diminishes, the temperature falls, the general appearance improves. But there is an element of danger in this stage because the sudden relief of symptoms may raise doubts as to the veracity of the diagnosis. Unless the condition is relieved by treatment the signs and symptoms are re-established as the tension again rises, and the features are now those of a local septic infection.

The *diagnosis* is usually established without much difficulty from the intensity of the local symptoms and the evidences of severe toxic absorption. In some cases the depth of the lesion may lead to difficulty. Thus osteomyelitis of the ilium may be mistaken for appendicitis or infection of the hip-joint. A blood count should avoid confusion with acute rheumatism, and cellulitis should be excluded by the less intense toxæmia by which it is usually accompanied. As regards prognosis, the more distal the lesion and the more porous the bone the better is the outlook. The real danger lies in the septicæmia which may develop in the first stage of the disease. The tendency to this is perhaps greater in young children.

The speaker was of opinion that in a certain class of case operation was neither necessary nor desirable. These were the cases described by pathologists as albuminous or serous *osteomyelitis*, a large proportion of which were produced by pneumococcal infection. In these cases operation in the early stages was likely to result in spreading the infection and in the production of necrosis. They usually occur in babies and young children, the temperature is rarely as high as in the ordinary suppurative osteomyelitis, the toxæmia is slight, and the neighbouring joint is usually the site of a serous effusion. A blood count shows that there is only a small degree of *leucocytosis*. In these cases operation should be delayed, and extension applied to the limb, with fixation splints and hot local applications. Under this treatment a large number of the cases will resolve, and even if suppuration ensues it is local in its extent. It is to be suspected if the temperature rises after a preliminary fall, if pain persists, or if local redness or œdema appear. Relief may be obtained by a single trephine opening over the focus of suppuration. In the ordinary cases, however, immediate operation is essential in order to cut short the grave risks of the first stage. A trephine opening is first made over the affected metaphysis, and this is followed by a series of openings along the shaft at intervals of three-quarters of an inch until healthy marrow is reached. The intervening bone is now cut away with a chisel, so as to fully expose the infected area, but the marrow is not touched at all, as scraping it only disseminates the infection and leads to necrosis of the bone. The wound is left widely open and Carrel-Dakin treatment is established. In three weeks it may be possible to close the wound partially by secondary suture. The speaker had tried the method of subperiosteal resection of the affected portion of the diaphysis, but has abandoned it except in those cases where the whole of the diaphysis has perished. He considered that it was likely to dissemi-

Home Secretary, the Lord Chief Justice, and the judge who tried the convicted person. This seems a combination open to objections, particularly with regard to the judge who tried the case. Moreover, if such a committee is ever instituted it should include a member of the medical profession of recognised eminence. He would not necessarily, or desirably, be an alienist or one connected with any special branch of medicine. Prisoners are reprieved upon medical grounds of varying nature. For example, True was reprieved on the ground of his mental condition; Mrs. Maybrick and others have been sentenced and not executed on account of questions relating to the precise cause of the death of the person alleged to have been murdered. If such a committee as that suggested should ever be formed, there would certainly be many occasions upon which a medical man would materially assist his colleagues in the weighing of medical evidence.

Coroners and Murder or Manslaughter.

Sir Harry Poland, in a letter to the *Times*, has made a suggestion that when an inquest is being held by a coroner and a prosecution takes place at the same time in a criminal court for murder or manslaughter, the same death forming the subject of the prosecution and of the inquest, the inquest should be suspended until the criminal proceedings have been concluded. A proposal coming from so eminent an authority on the practical working of the criminal law commands respect, and no doubt full consideration will be given to Sir Harry Poland's suggestion whenever (or if ever) the long-delayed amendment of the law relating to inquests takes place. He cites the report of a Royal Commission in 1879, which said that "the proceeding upon coroner's inquisitions is a relic of the times preceding the appointment of justices of the peace." His strongest argument against the dual proceedings, in the coroner's court and before magistrates, which precede trial at assizes, is that the time of witnesses is taken up unnecessarily. Medical practitioners who have had to give evidence on such occasions will be aware how many valuable hours are wasted in waiting about on these occasions, in addition to the possibly brief period of time which is spent in the witness-box. The time of experts is no less wasted in repeating the same evidence which again has to be given later. All these should be thoroughly in sympathy with the proposed alteration, and it will be interesting to see what legal critics may have to say on the subject. They are aware of the anomalies attaching to inquest verdicts and proceedings. In the recent case of Vaquier the coroner's jury found a verdict which left open the question of who had placed the poison in the bottle from which the dead man took the fatal draught, and this was employed as an argument by some of those persons who advocated the Frenchman's reprieve. That it has had no effect on Vaquier's ultimate fate tends to show that the verdict at an inquest is of little value. At the inquest upon Miss Kaye letters were read from the deceased to her friends which could not have been made evidence at Mahon's trial, which suggests that an inquest may prejudice a prisoner when tried for his life, owing to the publication of matter not relevant to his guilt. In fact, in the case of Mahon a letter of similar character to those read at the inquest led to newspapers which published it being fined for "contempt of court." The gravity of the penalty attaching to murder may be urged as an argument for retaining the triple hearing, but it seems doubtful whether that is a reason of such weight that it ought to prevail. The fact of coroners not being responsible for inquiries in obvious cases of murder would do away with any argument against the appointment of medical men in preference to lawyers, and the medical man of experience would show himself the best person to inquire into all unexplained deaths, including those which through his investigation may turn out to have been due to criminal acts. Sir Harry Poland's suggestion has much to commend it.

A Secret Well Kept.

In a case committed for trial at Rotherham, the prisoner being charged with concealment of birth after the finding of the dismembered body of an infant, observations were made by counsel upon the conduct of a medical man, Dr. W. L. Dibb, and of a deputy coroner, to the effect that they had not assisted the police in elucidating the case. Dr. Dibb, in particular, had given no information to the police as to what he knew or suspected with regard to the remains which had been submitted to him. In explanation of this, at the close of his evidence before the magistrates, Dr. Dibb made a statement to the effect that, finding himself in the possession of certain information, he had consulted a solicitor as to the course he should adopt, and the solicitor had expressed a wish to take counsel's opinion before expressing himself definitely. The witness had also consulted a senior practitioner at Rotherham and a consultant at Sheffield, who had agreed that he ought not to make a statement to the police. In the witness-box Dr. Dibb had given evidence, after having heard authorities cited by counsel, which were to the effect that he could not refuse to do so. He appears to have acted perfectly correctly, both in giving evidence when in the witness-box and when the court refused to absolve him from the obligation to give it, and in not going out of his way to make statements to the police before. He also acted wisely in taking advice on the subject from those best qualified to assist him and in acting on their recommendations. The kind of circumstances, in which he evidently found himself involved, are such as may occur in the practice of any medical man. A doctor is not at law absolved owing to his profession from the ordinary duties of a citizen to assist in the administration of justice if called upon to do so. No medical man, however, will admit that because his profession brings him in contact with what may be a "guilty secret," his duty as a citizen calls upon him to play the detective and assist the police in any and every case in which he suspects the past or future perpetration of a criminal act by his patient. He must be guided to some extent by the facts of the particular case, and it may be suggested as an example that if he has reason to believe that the life of a human being is threatened, or that murder has been committed, he is placed in a very different position from that of merely suspecting that a patient may have been connected with an offence against property.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 2ND, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 36; scarlet fever, 1330; diphtheria, 663; enteric fever, 94; pneumonia, 458; puerperal fever, 37: cerebro-spinal fever, 2; acute poliomyelitis, 27; acute polio-encephalitis, 4; encephalitis lethargica, 68; dysentery, 6; ophthalmia neonatorum, 108. Of the cases of ophthalmia 12 were reported from the County of London, 3 from West Hartlepool, 2 from Easington R.D. (co. Durham), 5 from Liverpool, 4 from Newcastle-on-Tyne, 4 from Stoke-on-Trent, 12 from Birmingham, 7 from Sheffield; 6 from the boroughs and urban districts of Glamorgan—namely, Aberdare, Caerphilly, Ogmore and Garw, Port Talbot (each 1), and Rhondda (2).

Deaths.—In the aggregate of great towns (including London) there were 6 deaths from enteric fever, 9 from scarlet fever, 21 from diphtheria, 22 from measles, and 15 from influenza. In London itself the diphtheria deaths numbered 8.

THE LATE DR. R. T. JONES.—Dr Richard Thomas Jones, L.R.F.P.S. Glasg. and L.S.A. Lond, who recently died at his residence in Harlech, Merionethshire, began to practise in 1879. He received his medical education at Owens College, Manchester, and at Guy's Hospital, London, and settled in Wales, where he worked for 45 years. He was one of the first medical men in the Principality to advocate total abstinence on which subject he wrote several pamphlets. He was medical officer and public vaccinator for the Llanfihangel district of the Festiniog Union. For over 30 years he was district magistrate and was also High Sheriff of Merioneth.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 288.)

SECTION OF SURGERY.

WEDNESDAY, JULY 23RD.

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Acute Osteomyelitis

was opened by MR. JOHN FRASER (Edinburgh). He began by pointing out the confusion which exists as to anatomical terms in relation to the structure of the bones, and defined the metaphysis as that portion of the diaphysis which lies adjacent to the epiphyseal cartilage. He said: The metaphysis is the site during the years of growth of the most intense cell activity and is the most vascular area of the bone. It is the site of origin of most of the inflammatory diseases of the bones, and in particular of acute osteomyelitis. This is essentially an infective process in the interior of the bone, the endosteum and the marrow being first affected. It is only at a later stage that the infection spreads through the bone and involves the periosteum. A primary periostitis is extremely rare. Acute osteomyelitis is then the result of an acute pyogenic infection of the metaphysis, and it is essentially an affection of the age of growth. In the vast majority of cases the infection is blood-borne, and this presupposes a mild form of septicæmia. That such a septicæmia occurs, and indeed is common in young children, the recent work of Lipschitz shows. The source may be any septic focus, in the teeth, tonsils, sinuses, or skin for example, or pneumonia and the exanthemata. An important source is the umbilicus, and Mr. Fraser referred to a series of 30 cases in young infants which he had collected in the last four years, all of them fatal. In his opinion umbilical infection is a common origin of obscure blood infection in infancy, the infection sometimes persisting until the years of later childhood. The disease tends to be localised in certain special sites, and in order of frequency these are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and the upper end of the humerus. Slight trauma is probably an important factor in causation, and this would explain the high proportion of cases in boys and in the lower limbs, but the trauma must be slight, probably resulting only in a small metaphyseal hæmorrhage. The large metaphyseal surfaces seem to be more readily affected than the small. Boys are affected more often than girls in the proportion of 6 to 1, and the eighth to the twelfth year is the period in which the disease is most common. In a series of 400 cases the responsible organism was the *Staphylococcus aureus* in 78 per cent., the pneumococcus in 14 per cent., and the streptococcus in 6 per cent. The number of cases of pneumococcal infection was an important point to be discussed later.

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Home Secretary, the Lord Chief Justice, and the judge who tried the convicted person. This seems a combination open to objections, particularly with regard to the judge who tried the case. Moreover, if such a committee is ever instituted it should include a member of the medical profession of recognised eminence. He would not necessarily, or desirably, be an alienist or one connected with any special branch of medicine. Prisoners are reprieved upon medical grounds of varying nature. For example, True was reprieved on the ground of his mental condition; Mrs. Maybrick and others have been sentenced and not executed on account of questions relating to the precise cause of the death of the person alleged to have been murdered. If such a committee as that suggested should ever be formed, there would certainly be many occasions upon which a medical man would materially assist his colleagues in the weighing of medical evidence.

Coroners and Murder or Manslaughter.

Sir Harry Poland, in a letter to the *Times*, has made a suggestion that when an inquest is being held by a coroner and a prosecution takes place at the same time in a criminal court for murder or manslaughter, the same death forming the subject of the prosecution and of the inquest, the inquest should be suspended until the criminal proceedings have been concluded. A proposal coming from so eminent an authority on the practical working of the criminal law commands respect, and no doubt full consideration will be given to Sir Harry Poland's suggestion whenever (or if ever) the long-delayed amendment of the law relating to inquests takes place. He cites the report of a Royal Commission in 1879, which said that "the proceeding upon coroner's inquisitions is a relic of the times preceding the appointment of justices of the peace." His strongest argument against the dual proceedings, in the coroner's court and before magistrates, which precede trial at assizes, is that the time of witnesses is taken up unnecessarily. Medical practitioners who have had to give evidence on such occasions will be aware how many valuable hours are wasted in waiting about on these occasions, in addition to the possibly brief period of time which is spent in the witness-box. The time of experts is no less wasted in repeating the same evidence which again has to be given later. All these should be thoroughly in sympathy with the proposed alteration, and it will be interesting to see what legal critics may have to say on the subject. They are aware of the anomalies attaching to inquest verdicts and proceedings. In the recent case of Vaquier the coroner's jury found a verdict which left open the question of who had placed the poison in the bottle from which the dead man took the fatal draught, and this was employed as an argument by some of those persons who advocated the Frenchman's reprieve. That it has had no effect on Vaquier's ultimate fate tends to show that the verdict at an inquest is of little value. At the inquest upon Miss Kaye letters were read from the deceased to her friends which could not have been made evidence at Mahon's trial, which suggests that an inquest may prejudice a prisoner when tried for his life, owing to the publication of matter not relevant to his guilt. In fact, in the case of Mahon a letter of similar character to those read at the inquest led to newspapers which published it being fined for "contempt of court." The gravity of the penalty attaching to murder may be urged as an argument for retaining the triple hearing, but it seems doubtful whether that is a reason of such weight that it ought to prevail. The fact of coroners not being responsible for inquiries in obvious cases of murder would do away with any argument against the appointment of medical men in preference to lawyers, and the medical man of experience would show himself the best person to inquire into all unexplained deaths, including those which through his investigation may turn out to have been due to criminal acts. Sir Harry Poland's suggestion has much to commend it.

A Secret Well Kept.

In a case committed for trial at Rotherham, the prisoner being charged with concealment of birth after the finding of the dismembered body of an infant, observations were made by counsel upon the conduct of a medical man, Dr. W. L. Dibb, and of a deputy coroner, to the effect that they had not assisted the police in elucidating the case. Dr. Dibb, in particular, had given no information to the police as to what he knew or suspected with regard to the remains which had been submitted to him. In explanation of this, at the close of his evidence before the magistrates, Dr. Dibb made a statement to the effect that, finding himself in the possession of certain information, he had consulted a solicitor as to the course he should adopt, and the solicitor had expressed a wish to take counsel's opinion before expressing himself definitely. The witness had also consulted a senior practitioner at Rotherham and a consultant at Sheffield, who had agreed that he ought not to make a statement to the police. In the witness-box Dr. Dibb had given evidence, after having heard authorities cited by counsel, which were to the effect that he could not refuse to do so. He appears to have acted perfectly correctly, both in giving evidence when in the witness-box and when the court refused to absolve him from the obligation to give it, and in not going out of his way to make statements to the police before. He also acted wisely in taking advice on the subject from those best qualified to assist him and in acting on their recommendations. The kind of circumstances, in which he evidently found himself involved, are such as may occur in the practice of any medical man. A doctor is not at law absolved owing to his profession from the ordinary duties of a citizen to assist in the administration of justice if called upon to do so. No medical man, however, will admit that because his profession brings him in contact with what may be a "guilty secret," his duty as a citizen calls upon him to play the detective and assist the police in any and every case in which he suspects the past or future perpetration of a criminal act by his patient. He must be guided to some extent by the facts of the particular case, and it may be suggested as an example that if he has reason to believe that the life of a human being is threatened, or that murder has been committed, he is placed in a very different position from that of merely suspecting that a patient may have been connected with an offence against property.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 2ND, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 30; scarlet fever, 1330; diphtheria, 663; enteric fever, 94; pneumonia, 458; puerperal fever, 37; cerebro-spinal fever, 2; acute poliomyelitis, 27; acute polio-encephalitis, 4; encephalitis lethargica, 68; dysentery, 6; ophthalmia neonatorum, 108. Of the cases of ophthalmia 12 were reported from the County of London, 3 from West Hartlepool, 2 from Easington R.D. (co. Durham), 5 from Liverpool, 4 from Newcastle-on-Tyne, 4 from Stoke-on-Trent, 12 from Birmingham, 7 from Sheffield; 6 from the boroughs and urban districts of Glamorgan—namely, Aberdare, Caerphilly, Ogmore and Garw, Port Talbot (each 1), and Rhondda (2).

Deaths.—In the aggregate of great towns (including London) there were 6 deaths from enteric fever, 9 from scarlet fever, 21 from diphtheria, 22 from measles, and 15 from influenza. In London itself the diphtheria deaths numbered 8.

THE LATE DR. R. T. JONES.—Dr Richard Thomas Jones, L.R.F.P.S. Glasg. and L.S.A. Lond, who recently died at his residence in Harlech, Merionethshire, began to practise in 1879. He received his medical education at Owens College, Manchester, and at Guy's Hospital, London, and settled in Wales, where he worked for 45 years. He was one of the first medical men in the Principality to advocate total abstinence on which subject he wrote several pamphlets. He was medical officer and public vaccinator for the Llanfihangel district of the Festiniog Union. For over 30 years he was district magistrate and was also High Sheriff of Merioneth.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 296.)

SECTION OF SURGERY.

WEDNESDAY, JULY 23RD.

ON the first day, Sir CUTHBERT WALLACE, the President, being in the chair, a discussion on

Acute Osteomyelitis

was opened by Mr. JOHN FRASER (Edinburgh). He began by pointing out the confusion which exists as to anatomical terms in relation to the structure of the bones, and defined the metaphysis as that portion of the diaphysis which lies adjacent to the epiphyseal cartilage. He said: The metaphysis is the site during the years of growth of the most intense cell activity and is the most vascular area of the bone. It is the site of origin of most of the inflammatory diseases of the bones, and in particular of acute osteomyelitis. This is essentially an infective process in the interior of the bone, the endosteum and the marrow being first affected. It is only at a later stage that the infection spreads through the bone and involves the periosteum. A primary periostitis is extremely rare. Acute osteomyelitis is then the result of an acute pyogenic infection of the metaphysis, and it is essentially an affection of the age of growth. In the vast majority of cases the infection is blood-borne, and this presupposes a mild form of septicæmia. That such a septicæmia occurs, and indeed is common in young children, the recent work of Lipschitz shows. The source may be any septic focus, in the teeth, tonsils, sinuses, or skin for example, or pneumonia and the exanthemata. An important source is the umbilicus, and Mr. Fraser referred to a series of 30 cases in young infants which he had collected in the last four years, all of them fatal. In his opinion umbilical infection is a common origin of obscure blood infection in infancy, the infection sometimes persisting until the years of later childhood. The disease tends to be localised in certain special sites, and in order of frequency these are the upper end of the tibia, the lower end of the femur, the lower end of the tibia, and the upper end of the humerus. Slight trauma is probably an important factor in causation, and this would explain the high proportion of cases in boys and in the lower limbs, but the trauma must be slight, probably resulting only in a small metaphyseal hæmorrhage. The large metaphyseal surfaces seem to be more readily affected than the small. Boys are affected more often than girls in the proportion of 6 to 1, and the eighth to the twelfth year is the period in which the disease is most common. In a series of 400 cases the responsible organism was the *Staphylococcus aureus* in 78 per cent., the pneumococcus in 14 per cent., and the streptococcus in 6 per cent. The number of cases of pneumococcal infection was an important point to be discussed later.

The disease starts in the metaphysis with an intense primary infection of the medulla. The inflammatory products are under extreme tension, and this accounts for the intensity of the local symptoms and the severity of the toxæmia which results. From the point of view of prognosis this is the most dangerous stage, for it is now that septicæmia in an acute form is most likely to occur. The second stage is evidenced by a spread of the infection from the interior of the bone into the subperiosteal area. The vessels and spaces of the Haversian canals are the routes along which the migration occurs, and a serous subperiosteal effusion is followed by a purulent one. With the relief of tension the symptoms abate and the prognosis improves. The facility with which the second stage can be established will depend on the number of the Haversian canals and the porosity of the bone, and the density of the femur may account for the severity of the symptoms associated with infections of this bone. The greater porosity of the tibia and the humerus makes it easier for the products of inflammation to escape from the interior of the bone. The third stage is that of reaction. The osteoblasts in the deeper layers of the periosteum proliferate, an involucrum is laid down, and the dead portion of the diaphysis is separated by the active phagocytic action of the granulation tissue which is formed.

The *clinical features* are intense and distinctive. There is the agonising pain of the early stage while the infection is still locked up under tension in the interior of the bone. It is during this stage that the signs of toxæmia—the high temperature, the delirium, the poisoned appearance—are greatest. It is at this stage that a massive invasion of the blood-stream may inaugurate a septicæmia which by its intensity overshadows the local signs. With the relief of tension which characterises the stage of subperiosteal effusion there is an immediate abatement of signs and symptoms, the pain diminishes, the temperature falls, the general appearance improves. But there is an element of danger in this stage because the sudden relief of symptoms may raise doubts as to the veracity of the diagnosis. Unless the condition is relieved by treatment the signs and symptoms are re-established as the tension again rises, and the features are now those of a local septic infection.

The *diagnosis* is usually established without much difficulty from the intensity of the local symptoms and the evidences of severe toxic absorption. In some cases the depth of the lesion may lead to difficulty. Thus osteomyelitis of the ilium may be mistaken for appendicitis or infection of the hip-joint. A blood count should avoid confusion with acute rheumatism, and cellulitis should be excluded by the less intense toxæmia by which it is usually accompanied. As regards prognosis, the more distal the lesion and the more porous the bone the better is the outlook. The real danger lies in the septicæmia which may develop in the first stage of the disease. The tendency to this is perhaps greater in young children.

The speaker was of opinion that in a certain class of case operation was neither necessary nor desirable. These were the cases described by pathologists as albuminous or serous osteomyelitis, a large proportion of which were produced by pneumococcal infection. In these cases operation in the early stages was likely to result in spreading the infection and in the production of necrosis. They usually occur in babies and young children, the temperature is rarely as high as in the ordinary suppurative osteomyelitis, the toxæmia is slight, and the neighbouring joint is usually the site of a serous effusion. A blood count shows that there is only a small degree of leucocytosis. In these cases operation should be delayed, and extension applied to the limb, with fixation splints and hot local applications. Under this treatment a large number of the cases will resolve, and even if suppuration ensues it is local in its extent. It is to be suspected if the temperature rises after a preliminary fall, if pain persists, or if local redness or œdema appear. Relief may be obtained by a single trephine opening over the focus of suppuration. In the ordinary cases, however, immediate operation is essential in order to cut short the grave risks of the first stage. A trephine opening is first made over the affected metaphysis, and this is followed by a series of openings along the shaft at intervals of three-quarters of an inch until healthy marrow is reached. The intervening bone is now cut away with a chisel, so as to fully expose the infected area, but the marrow is not touched at all, as scraping it only disseminates the infection and leads to necrosis of the bone. The wound is left widely open and Carrel-Dakin treatment is established. In three weeks it may be possible to close the wound partially by secondary suture. The speaker had tried the method of subperiosteal resection of the affected portion of the diaphysis, but has abandoned it except in those cases where the whole of the diaphysis has perished. He considered that it was likely to disseminate the infection, and that there was a real risk that a new bone would fail to develop. He regarded the method as justifiable only in late and neglected cases, such as should not now occur.

The *general treatment* of these cases has not received the attention it deserves. Regarding osteomyelitis as primarily a septicæmia with a secondary local focus, it is obvious that the general infection should receive adequate treatment. He advised the use of vaccines, commencing with 200 million of a stock staphylococcal vaccine, and going on to an autogenous vaccine as soon as possible. In grave cases a stock serum, a specially immunised serum, or ordinary horse serum are useful. Blood transfusion had given striking results, especially when combined with exsanguination, both in the very acute cases and in those in which septicæmia persists in spite of treatment.

Discussion.

The discussion which followed turned chiefly on two points—the avoidance of operation in mild cases and subperiosteal resection of the bone. Mr. B. C. MAYBURY (London) held that early operation is wrong in all mild cases and would not admit that expectant treatment should be limited to those where a pneumococcal infection was suspected. He regarded osteomyelitis as a localisation of a pre-existing septicæmia, and pointed to the widespread pain in the limbs which often occurs as a prodromal symptom as evidence of multiple abortive infections. His views were supported by Dr. T. W. LIPSCOMB (Sydney), who stated that in Australia, thanks to cleanliness and fresh air, acute osteomyelitis is rare, and that most cases clear up on expectant treatment. It is remarkable that even in this country cases among the upper classes are rare. It would appear to be essentially a disease of dirt and lack of nourishment.

Very divergent views were expressed as to the value of resection of the affected portions of the diaphysis. Mr. ALEX. MITCHELL (Aberdeen) and Mr. ACTON DAVIS (London) supported the method strongly as leading to a more rapid convalescence and to the formation of a solid core of bone instead of a hollow involucrum which might contain a persistent abscess cavity. Mr. Mitchell regarded it as the method of choice in severe cases where the bone was stripped of periosteum in the greater part of its circumference. He treats the resulting cavity by the Carrel-Dakin method, followed by secondary suture of the wound. He regards early movement as essential, and in the series of photographs which he showed the range of movement obtained was remarkable.

The general impression left by the discussion, in which Sir CUTHBERT WALLACE, Prof. G. E. GASK (London), and several other surgeons took part, was that in mild cases rest, extension, and hot applications might abort the disease, that in most cases a careful and limited exposure of the medulla is sufficient, and that in those cases where the periosteum is completely stripped from the whole circumference of the bone resection of the affected portion of the shaft is the most rapid and effective method. These last cases are, however, the result of neglect and ought never to be seen.

THURSDAY, JULY 24TH.

On the second day, Prof. G. E. GASK, Vice-President, being in the chair, a discussion on

Post-operative Pulmonary Embolism

was opened by Mr. J. P. LOCKHART-MUMMERY (London). He pointed out that the condition is probably much more common than is generally supposed, for probably nine out of ten cases recover, and that it seems likely that a large proportion of cases of post-operative pneumonia are really cases of pulmonary embolism. It may occur at any period after operation up to several weeks, but is most common about the ninth day. The average incidence of fatal cases is about one for every thousand operations. The onset is accompanied by acute dyspnœa and pain in the chest, but if the patient survives ten minutes the symptoms subside and he generally recovers. He will, however, have signs of a localised pneumonia, with rise of temperature, cough, rusty sputum, dullness, and tubular breathing. The distinction from ordinary pneumonia lies in the acute pain and dyspnœa of the onset, the comparatively low temperature, and the previous good health. Sudden death after operation may occur as the result of cerebral embolism, and it was shown by Wilson, of the Mayo Clinic, that 20 per cent. of such deaths were of this nature. It seems probable that the source of the embolus may be a primary pulmonary thrombosis. Where, on the other hand, a large area of the pulmonary arterial field is cut off the symptoms are those of severe cardiac embarrassment, and the dyspnœa is not due to the fact that part of the lung is put out of action but to the strain put on the heart by the sudden limitation of the area of pulmonary circulation. It follows that the administration of strychnine and stimulants during such an attack is entirely wrong and that the proper treatment is the use of amyl nitrite, morphine, and atropine. A loose clot passing through the right side of the heart may completely block one or both pulmonary arteries, or it may pass further on and come to rest in one of the smaller pulmonary arteries. In the former case death will ensue in a few minutes from the strain thrown on the right side of the heart, whilst in the latter the circulation will be cut off from a cone-shaped portion of the lung and symptoms of localised pneumonia will result. In any event the pulmonary embolism is a secondary condition, and the primary and important question is the source of the clot. In the few cases where definite evidence is available the primary clot has generally been formed in the internal or external iliac veins, or at their junction with the inferior vena cava. It has frequently been assumed, the speaker said, that the clot arises in the area of operation, but this is usually improbable and often impossible. The bulk of the fatal cases of pulmonary embolism have occurred where operations have been performed upon the gall-bladder or the viscera of the lower abdomen, and in the majority of these the venous return from the operation area was into the portal circulation. It seems, then, that the clot forms in the vena cava or its branches quite irrespective of the operation area, and that it is due to stasis in the great venous trunks rather than to any injury to contributory veins. It is a well-established fact that in almost all cases of pulmonary embolism the operation has been upon the abdomen or the lower limbs, and especially upon the pelvic viscera. It is suggested that the reason lies in the greater degree of immobility both during and after the operation than occurs in operation elsewhere. The position of the patient, and the pressure of retractors and packs, must tend to arrest the circulation in the inferior vena cava, and the interference with the action of the diaphragm will have the same effect. It seems probable that venous stasis is the most important predisposing cause of pulmonary embolism, and this would explain why anæmic patients are more prone to the condition, whilst in children it is practically unknown. The post-operative pneumonia of children is invariably of the broncho-pneumonic type.

There is no evidence to show, Mr. Lockhart-Mummery said, that sepsis plays any part in the occurrence of pulmonary embolism, except in so far as it may prevent movement or encourage the formation of intravascular clots. The great majority are clean cases with no evidence of sepsis at all. There must, however, be some other factor than stasis, for otherwise embolism would occur in paralysed persons, or even after normal sleep, and also we know by experiments that thrombosis does not occur with normal blood in a normal vein. The presence of thrombokinase is essential, but a certain quantity of this substance is liberated whenever a wound is made. Now it can be shown that thrombokinase produces clotting in intravascular blood only if the blood is stationary, and that it can be introduced in large quantities into circulating blood without effect. It would seem, then, that the formation of the clot which gives rise to pulmonary embolism depends upon two factors—the liberation of thrombokinase and the presence of stasis. As regards prevention, it is advised that purgation and starving before operations be avoided, that operating tables be fitted with mattresses, that constrained positions during operations should be avoided, and that every effort be made after operation to maintain a satisfactory circulation in the trunk and lower limbs.

Discussion.

The discussion was continued by Sir **CHARLES GORDON-WATSON** (London), who pointed out that the incidence of embolism, far from being reduced by improvements in surgical technique, had actually increased. At St. Bartholomew's Hospital in 29,000 operations there had been 21 fatal cases of pulmonary embolism. The underlying cause was thrombosis in the large veins occurring soon after operation, and embolism was actually less likely to occur in mild sepsis, since the clots which formed were more firmly attached to the walls of the vessels. Sudden movement was often the immediate cause of displacement of the clot, and he described a case of wiring of the patella for fracture where the patient made a perfectly normal recovery, was wheeled to the lift in a chair, and died in the lift as the result of a pulmonary embolus, the thrombus having been displaced by the sudden movement of the lift. He thought that the factors in the production of the thrombi were the release of thrombokinase in the wound, injury to the deep epigastric, the uterine veins, or other tributaries of the inferior vena cava, and hæmorrhage into the tissues, with resulting pressure on the veins. Predisposing causes were loss of fluid, lowering of the blood pressure, and the effect of posture on the venous return. He advised gentle operating, careful hæmostasis, the avoidance of extreme postures on the table, and the early commencement of massage and movement after operation.

Prof. **J. SHAW DUNN** (Manchester) gave his own experience of seven cases of pulmonary embolism, in each of which there was found in the pulmonary artery a large cast of the iliac veins. The thrombus having left its site of origin there was, of course, no abnormality found in the vein from which it had presumably arisen, but projecting into this vein there was found in each instance a small tag of clot arising in a small tributary vein, and on tracing this clot along the tributary it was always found to lead to the site of operation. In each of these cases a very mild localised sepsis *was* present, and it was pointed out how often thrombosis in a vein is associated with neighbouring sepsis. Thrombosis of the lateral sinus is commonly associated with middle-ear disease, of the pelvic veins with sepsis of the uterus, of the portal veins with a septic appendix.

Prof. **E. E. GLYNN** (Liverpool), in a very remarkable communication, stated his belief that a large number of cases described as pulmonary embolism are really cases of pulmonary thrombosis. A close examination of the lungs often shows a localised thrombosis, even where death has been so rapid as to suggest embolism as the only rational explanation, the duration of life in his cases ranging from 10 to 20 minutes after the acute onset. That the thrombus was not only ante-mortem but of some age was shown by the fact that frequently the arterial wall had absorbed pigment from the thrombus, and that in one case the pigment from a large thrombus in the heart had spread into the cardiac muscle. In a large proportion of the cases a non-hæmolytic streptococcus was found to be present in the thrombus. He believes that these thrombi form in the pulmonary artery itself, remaining latent until the lumen of the vessel has been narrowed to an extreme degree, when some small change in the position or form of the thrombus precipitates the final catastrophe.

Mr. **JAMES BERRY** (London) considered that the surest way to produce pulmonary embolism was to undertake a pelvic operation, to do it roughly, to tie off large masses of tissue in the immediate neighbourhood of large veins, and to keep the patient recumbent for some weeks. He advised very early movement after all operations on the trunk and legs, starting with chest exercises next day, combined with a regular arm drill. Prof. Glynn gave details of such a system in the gynæcological wards at Liverpool, and stated that the mortality from pulmonary embolism had been reduced from 4 per cent. to 1 per cent. of the whole operative deaths, whilst the mortality from this in the surgical wards, where this method had not been then adopted, remained constant. Whether the original site of these clots be in the systemic veins or in the pulmonary artery itself, such a system of exercises must necessarily reduce the possibility of stasis and the accompanying risk of thrombosis and of embolism

FRIDAY, JULY 25TH.

On the third day, Mr. **HAROLD BURROWS**, Vice-President, being in the chair, Mr. **T. P. DUNHILL** (London) read a short paper on

Auricular Fibrillation occurring in Toxic Goitre.

In cases of exophthalmic goitre referred to him irregularity of the heart was a not uncommon symptom, and in a number of these cases electrocardiographic tracings had shown that auricular fibrillation was present. In such cases it seemed rational to remove a portion of the thyroid and thus relieve the heart from this source of toxin. One case of this kind was that of a woman who had been seriously ill for 12 months with an irregular pulse, a loud systolic murmur at the apex, and swelling of the legs. Tracings showed well-marked auricular fibrillation. The right lobe and isthmus of the thyroid gland were removed under local anæsthesia, and three weeks later two-thirds of the left lobe. Her pulse dropped to 72, she became perfectly well, and she has remained so whilst following a strenuous employment. In all cases it is necessary, the speaker said, to remove a large portion of the thyroid tissue, usually the whole of one lobe and two-thirds of the other, but even then the fibrillation does not invariably clear up until a course of quinidine has been given. This is, however, a drug to be used with caution and only under expert medical supervision. In a large number of cases the combination of operation with quinidine results in rapid and permanent cure. It is, however, necessary to recognise that patients may have auricular fibrillation associated with goitre, in whom the goitre is not the cause of the fibrillation. A presystolic murmur or a history of rheumatic fever may assist the diagnosis, and the toxæmia of the typical thyroid is not present. But in many cases symptoms of profound thyroid toxæmia leave no room for doubt, the rapid pulse, moist warm skin, and staring, restless eyes. An investigation of the metabolic rate may give information of importance. If a portion of the gland is removed hyperactivity will be shown by the masses of cuboidal or even columnar cells which have replaced the flat cells lining the acini of the normal gland. This change in the form of the cells he regarded as the essential feature in the histology of Graves's disease.

Mr. **GEOFFREY KEYNES** (London) read a paper on

Blood Donors.

He referred to the important place which blood transfusion has since the war taken in surgical procedures, and pointed out that for its proper performance an organised supply of suitable donors was essential. They are often required in an emergency, when it is only too likely to happen that a suitable donor of the appropriate group cannot be found. Extensive experience has taught that a healthy young man can part with 750 c.cm. of blood, or even more, without any immediate effect, and that after a short rest he can perform an ordinary day's work as if nothing had happened. Fainting is psychological and is due not to the loss of blood, but to apprehension of the small operation involved.

It has, in fact, been noted that after a few days the donor feels in better and more vigorous health than before, and that he may even put on weight. The most suitable individuals are healthy men between the ages of 20 and 40. Women stand the loss of blood worse than men, and from a greater deposit of subcutaneous fat it may be more difficult to reach a vein in them by direct puncture, as should always be done. Perfect health and the absence of such infections as syphilis and malaria is essential, and this is another argument against the chance donor. It is generally thought that donors of group IV. can be used indiscriminately for any recipient, but this is probably only an approximation to the truth. In cases such as pernicious anæmia it is better to use a donor of the same group as the patient, and it is therefore well to have donors of all the groups available. In private practice there is no difficulty in providing donors. Suitable men are to be found quite willing to supply blood whenever required for a reasonable reward, and some of the professional donors give blood at intervals of six or occasionally even three weeks without inconvenience. In hospital, unless some system of payment can be organised, we have to depend on such casual donors as relatives or other patients in the ward. It has to be noted that consanguinity is no guarantee of compatibility of blood. Medical men and nurses should never be used, both on general principles and because their conditions of life are rarely productive of robust health. If medical students are used payment should be insisted on, as it is most undesirable that a sense of moral obligation should be induced. The speaker suggested that a properly organised supply of volunteer donors should be formed outside the hospitals among healthy individuals anxious to give personal service to the sick. Such groups might be found among Red Cross workers, who by character, training, and physique are peculiarly suited to the purpose.

Mr. H. P. **Winsbury White** (London) read a paper on

Hydronephrosis.

He pointed out that it is a fairly common surgical condition, rarely diagnosed until a late stage has been reached. It is most common in women, and between the ages of 20 and 50. The classical symptoms are rarely seen, and often intermittent pain is the only symptom. Sometimes a tumour may be felt, varying in dimensions from time to time, but it is only rarely that its disappearance is accompanied by the passage of a large amount of urine. Frequency is a symptom not of hydronephrosis but of the infection which is likely sooner or later to occur. Hæmaturia, from pressure on a vein, is not uncommon. The only final diagnosis of the condition is by means of a pyelogram. The concave lower border of the renal pelvis becomes convex, and this is followed by dilatation first of the upper calyx and then of the lower and middle calyces. In some cases large amounts of residual urine, 200 c.cm. or more, may be withdrawn by means of the ureteric catheter. In extreme cases of ureteric obstruction and stenosis it may be impossible to pass a ureteric catheter, and pyelography may thus fail. But in these cases there is usually a palpable tumour. Bilateral cases of hydronephrosis occur, and in these great caution is necessary before any operative treatment is undertaken. Infection is generally to be regarded as a contraindication to pyelography.

Mr. F. W. **Goyder** (Bradford) read a paper on

Hare-lip and Cleft Palate.

In regard to the former, he considered that it was unwise and unnecessary to remove the prominent premaxillary segment. Should it appear that the strain on the suture line of the lip would be too great if both sides of the lip were sutured at once, it was perfectly possible to suture one side at a time, leaving an interval of two or three weeks between the operations. In this way excessive tension was avoided and in the end the pressure of the lip would bring the premaxilla back into place. A sliding operation on the septum was fraught with risk to the vitality of the premaxilla. In regard to cleft palate, he considered that too much stress had been laid on closure of the cleft and too little on the obtaining of clear articulation. For the latter it was essential that it should be possible to approximate the soft palate to the back of the pharynx, and in order to do this satisfactorily it was in some cases necessary to forego closure of the hard palate. The aperture left could, however, be easily closed by means of an obturator.

SECTION OF PUBLIC MEDICINE AND INDUSTRIAL DISEASE.

Wednesday, July 23rd.

The Rôle of the General Practitioner in Preventive Medicine.

Dr. **Herbert Jones**, the President, in his opening remarks, drew attention to the fact that this was the first annual meeting at which the public health service, as represented by the Society of Medical Officers of Health, had been formally admitted to the B.M.A. representative meeting and its Council, and that there was now reciprocal representation of the Association on the Council of the Society. The Association had concerned itself much with the interests of the public health service, but it and the Society had not always travelled along parallel lines. There had sometimes been a tendency to make a sharp distinction between curative and preventive medicine. In his opinion there should be no distinction, and this section ought to be able to indicate how the general practitioner and the medical officer of health can help each other. The first medical officers of health were of necessity drawn from the ranks of the general practitioner and their success was largely due to the fact that they were conversant with the difficulties of the general practitioner. For a long period the medical service of the Local Government Board was recruited from the ranks of medical officers of health, and thus obtained insight into the methods and idiosyncrasies of local governing bodies. The public health service was proud of its achievements, but it fully recognised the help given by the marvellous triumphs of the physician and surgeon and of the laboratory worker. They needed the complete and intelligent coöperation of the general practitioner and the medical officer of health. The aim of both was the welfare of the community, and in the words of a great English novelist, " What is life for if not to make the world less difficult for one another ? "

The discussion was opened by Dr. **Peter Macdonald** (York). Commenting on the dictum, " The first duty of medicine is not to cure disease but to prevent it," he said that if Sir George Newman had substituted " ought to be " for " is " all would have agreed, but as the words stood they were exactly the opposite of the practice of the past and of the present, for most practitioners devoted their lives to the cure of disease already there and not to its prevention. Preventive action taken by the general practitioner was, so to speak, unofficial. Why was this ? The answer was obvious. Until recently the economic demand on the medical profession had been and still was for cure. Only within recent years had they begun to prevent, and still more recently had they been asked to prevent, and some of them paid to prevent. The receipt of their emoluments from people who were ill was a highly unstable proposition, and thus the club system arose as a semi-charity. The club system somewhat shifted the economic outlook. In 1912 the club system was enlarged on a grand scale into the National Health Insurance Medical Service, and thus incentives were given for preventive work which did not previously exist. He would deal with the present preventive activities of the general practitioner under several heads.

Early Treatment.—It was obvious that early treatment of one disease prevented others. The vaccination of contacts, the prophylactic administration of antitoxin for diphtheria and precautions against ophthalmia neonatorum were examples of what might almost be called early treatment, and naturally led up to advice on personal hygiene and protection of the other members of the family from disease.

How does the General Practitioner Fail to take Advantage of his Preventive Opportunities?—The answer is, he does not interest himself sufficiently in matters of bad environment which hinder his curing disease. Atmospheric pollution, bad housing conditions, bad work conditions, adulteration of food, alcoholic excess, all hinder cure and so become the concern of the general practitioner. The general practitioner could do much to stir up public opinion on matters like smoke pollution, which only existed owing to the ignorance and apathy of the community. The general practitioner ought also to educate public opinion on all matters of bad environment. At present the influence of the medical profession in Parliament and on local authorities was negligible.

Aims for the Future.—Houses built to live in are, generally speaking, not suitable to be ill in. To obtain the best from him the general practitioner must have hospitals in which to do more of his work. Childbirth was in every way better conducted in a nursing home than in a private house, and the nightmare of midwifery practice in a workman's cottage, with even two or three bedrooms, was good neither for the mother, the child, the doctor, nor the community. The provision of hospital beds in the country was grossly inadequate. In the second place, it was absurd that a medical service had been set up for the fathers, but did not include the mothers and children. If the National Health Insurance Service, which at present included one-third of the working-class people, were extended to the other two-thirds, the preventive aspect would be enormously increased. Thirdly, his knowledge of the work of pensions medical boards led him to the conclusion that this idea might be usefully applied to insured persons generally. The advantages of periodic examination of insured persons by boards would be great from the preventive point of view, but he was doubtful if public opinion was ripe for such a step.

Links between the General Practitioner and the Public Health Service.—He thought that in all the encroachments at present being made by the local and national public health authorities on the domain of the general practitioner, the maximum use should be made of the general practitioner by means of "part-time" service.

New Thoughts Influencing the Outlook on Health.—He had been interested in the writings of F. M. Alexander, H. C. Cameron, and W. A. Cochrane, pointing to the fact that health, physical and mental, depends upon a coördination of the whole body, which will make man largely superior to his environment, and for the general practitioner there will be a pre-eminent place in the application of such principles.

Discussion.

Prof. **Harold Kerr** (Newcastle-on-Tyne) said the general practitioner's want of interest in preventive medicine was partly due to the fact that public health was not attractively put before medical students. From the point of view of the general practitioner the medical officer of health used to be regarded as "not a proper doctor," "a kind of genteel plumber," and more recently, "a patient-snatcher." Sir George Newman had laid emphasis on our ignorance of natural processes, and there was no doubt that applied physiology was inadequately taught. The family doctor was in a good position to recommend improvements in environment. Little troubles were important. For example, constipation was promoted by nasty privies. Local divisions of the B.M.A. might do much to educate public opinion. He believed in "part-timers." Many of the recent whole-time appointments were cul-de-sac jobs, but part-timers must take their work seriously. He found that general practitioners did not sufficiently encourage breast-feeding.

Dr. **F. E. Fremantle**, M.P., thought there would ultimately be a place for health specialists in the latest applied physiology. The general practitioner might have great influence on public opinion, but there was no proper organisation for backing up the public health service or making the weight of medical opinion felt in Parliament.

Dr. **J. S. Manson** (Warrington) pleaded for sympathy with the difficulties of the general practitioner.

Dr. **F. E. Wynne** (M.O.H. Sheffield) had to thank the general practitioner for recent help in dealing with outbreaks of small-pox and encephalitis lethargica. In Sheffield they employed a "part-time" staff at the maternity and child welfare centre with satisfactory results. The general practitioner had not yet been able to wean the public from that extraordinary fetish, the 6 oz. bottle of medicine.

Dr. **H. B. Brackenbury** (London) said the general practitioner was the only person in a position to deal with preventive medicine of the whole organism. The use of vaccines was likely to extend and the work of the general practitioner to become more and more of the nature of personal and domestic hygiene. It was also extending to hygiene of the workshop. An increasingly close association was needed between the staff of the M.O.H. and the practitioners. The general practitioner must be given his opportunity. He needed time and money to investigate early disease and give prophylactic advice. This could be obtained by raising the capitation fee and thus allowing him to do more work on a smaller number of patients.

Dr. **J. R. Kaye** (M.O.H. West Riding) stated that 37 general practitioners worked in the centres established by the West Riding County Council. During health week last year 154 general practitioners gave lectures. In order to secure early notification of disease he had found provisional notification a useful procedure.

Dr. **David McKail** (Glasgow) said the "part-timer" was not utilised in Scotland. There were none in Glasgow. He pointed out the disadvantages of inexperienced whole-timers, and went on to say that there was insufficient coördination between the work of health centres and that of the parish authorities.

Dr. **Lockhart Stephens** (Warblington U.D.C.) said education was the keynote of preventive medicine. He believed that post-graduate courses in infant feeding for the general practitioner would do much good.

Dr. **H. Scurfield** asked who was going to carry out the new preventive midwifery. The new midwifery required more obstetrical skill and experience than emergency midwifery, and the general practitioner was doing less and less midwifery. It seemed to him that midwifery would fall into the hands of a panel of obstetricians, perhaps mostly women, who would act in coöperation, and not in competition, with the general practitioner.

Sir **Malcolm Watson** (Malaya) was surprised at the lack of unity in the profession at home. In 24 years they had made great progress in Malaya. They were now actually doing some antenatal work. Beri-beri had been controlled, and cholera and small-pox abolished, because it was obvious to the employers that these diseases interfered with the work of the plantations.

Dr. **Cecil Williams** (Todmorden) said the school medical officer and the general practitioner ought to coöperate in the first line of defence against disease. Some agreement as to what should be required of any general practitioner booked for a confinement was long overdue.

Dr. **N. R. Rawson** (Whitley Bay) said there was a want of coöperation on the part of the medical officer of health. The B.M.A. Division should act as the link.

Dr. **J. Hall-Edwards** (Birmingham) read a paper setting out what action the local authority might take in the control of cancer. He advocated the appointment of a committee in every large city to review periodically questions relating to cancer and to consider what steps should be taken to meet the requirements of the public and the medical profession. The first of these steps was compulsory notification.

Dr. W. Mitchell (i/c Electr. Dept., Bradford Royal Infirmary) considered that no man should be a specialist unless he had had some experience in general practice. He asked if cancer was less among Jews and Jewesses owing to the observance of the Mosaic law.

Dr. R. W. Stocks (West Bromwich) believed that coöperation between general practitioners and the public health service in his district was promoted by the fact that he and his assistants on their appointment called on all the medical men in the district. It had been an advantage to bring public health subjects, such as the use of the Schick test, before the B.M.A. Division. "Part-time" work at the infant welfare centres had been discontinued at the request of the general practitioners.

The whole discussion indicated a very good feeling between the general practitioners and the public health services, and a desire for closer coöperation. Before the session closed a resolution was passed asking the Council of the Association to institute an inquiry as to the best means of applying the experience of the profession to the work of Parliament.

THURSDAY, JULY 24TH.

Diet and Public Health.

Dr. J. Boyd Orr introduced this subject with a paper descriptive of the research work recently done at the Rowett Institute, Aberdeen, of which he is director. He expressed the opinion that there is now sufficient knowledge and sufficient interest to make dietetics an important factor in preventive medicine. During the past two or three years there had been a tendency to regard the evil effects of deficient dietaries as being due chiefly or entirely to the want of vitamins. It was now being recognised, however, that the amounts and proportions of the inorganic elements of the diet were of fundamental importance to the maintenance of health. It was impossible to make an unqualified statement as to the absolute amount of any mineral needed in the diet because many factors influenced its absorption or excretion. For example, it had been shown that an excess of potassium in the diet caused an increased excretion of sodium, and that the potassium-sodium ratio in the diet affected the assimilation of calcium and phosphorus. An excess of magnesium also interfered with the utilisation of calcium and so on. The first line of defence against rickets was the adjustment of the mineral contents of the diet. It was probable that calcium deficiency was common in infancy and early childhood, and was not only an important ætiological factor in rickets, but also in many other diseases associated with defective nutrition. A deficiency of iron was likely to be found in young children restricted to a diet of milk and refined cereals. The possibility of the deficiency of iodine was also worthy of consideration. In laying hens they found that iodine seemed to have an influence on calcium metabolism. Fortunately, mineral deficiencies could be easily corrected by including in the diet food-stuffs the virtues of which are universally recognised. Thus milk, green vegetables, and certain fruits were rich in calcium; milk, egg-yolk, and the embryo and bran of cereals were rich in phosphorus; green vegetables and egg-yolk were rich in iron. The only certain sources of iodine were green vegetables and cod-liver oil. Fruits and vegetables had an excess of alkali and could be used to correct a diet which was too acid. In his opinion much of the beneficial effect ascribed to vitamins was really due to the minerals present in the substances given as a source of vitamins. Of course, the inorganic constituents of the diet were only one aspect of nutrition, and further factors not connected with the diet, such as sunlight, exercise, and psychological influences, had to be taken into account.

Dr. J. S. Manson contrasted the robust and healthy appearance of men home on leave during the war and after the armistice with the deteriorated appearance and loss of weight of the same men within a year or so after their discharge from the services. He attributed the change to the inferior home dietary as compared with the service dietary.

In a paper on Diet Control as an Instrument of Public Health Progress, Dr. W. G. Savage (M.O.H. Somerset) expressed a very decided opinion that there was no measure likely to yield a better harvest in the improvement of the health of the community than education of the people in sound food habits. Our people persisted in faulty dietetic practices because no adequate steps were taken to enlighten them. The pessimist would declare that this was not practicable. The same was said with regard to infant feeding and rearing, but this had been refuted in the last few years. The application of similar educational measures to the whole of the public could be accomplished with greater difficulty but probably with equal success.

Dr. Robert Hutchison (London) was not satisfied that deficient diet or prolonged illness in infancy had a permanent effect on the physique of the individual. Infants brought to death's door by congenital pyloric stenosis often developed into fine children later on. He thought a deficient diet about the time of puberty was more likely to have a permanent effect. He could not see that a defective diet after being discontinued was likely to leave permanent effects on the heart, nervous or digestive system, or on the resistance to disease.

Dr. J. B. Simpson (Golspie) thought the physique of the crofters in the Highlands had deteriorated as the result of a change of diet. Tea and white bread and jam had taken the place of porridge and milk.

Dr. H. Scurfield believed that the national physique could be greatly improved by a better dietary. He thought legislation was required to regulate the use of preservatives in food; to enable us to know what we were getting when we bought flour or bread; to prevent foods being sold under misleading names, and to control infants' starchy foods. He thought we should not tie ourselves down with shibboleths about "natural foods," &c., but apply the knowledge we possessed to determining the essential goodness of every food at present used by man. It was very important that we should concentrate for the benefit of the public on the points on which we were agreed. For example, we were practically unanimous as to the need for more milk, vegetables, especially green vegetables, and fruit. Such advice would be approved both by those who were doing research work on vitamins, by those who, like Dr. Orr, attributed great importance to the mineral salts, by dentists, and by the crusaders against constipation.

Dr. A. L. Hoops (Malaya) said that beri-beri had been abolished in institutions by the prohibition of over-milled rice. It still existed and ravaged the general population because the labourers liked over-refined rice. Attempts to prohibit its use had led to riots. In the country districts, where under-milled rice, fruit, and vegetables formed the staple articles of the dietary, teeth were good, but in Singapore, where over-milled rice and white bread (with no milk) were in use, the children had very bad teeth. There was no rickets in Malaya, and this was attributed to the sunshine.

Dr. J. J. Paterson (M.O.H. East Berkshire Combined District) referred to the huge experiment in starvation experienced by Austria. The results appeared to be marked indelibly on the school-children. One could guess the year of their birth from their appearance. Every third child had a goitre. Fats and natural foods were at one time almost unobtainable. Could these effects be corrected by time? He hoped some systematic effort would be made to keep medical records of the progress of this vast involuntary experiment.

Dr. Orr, in replying, said it was impossible to be dogmatic as to whether the lessened resistance to disease caused by a bad diet leaves permanent effects, or can be worked off by the substitution of a good diet. He agreed with Dr. Scurfield that it was very necessary for us to attain the utmost possible unanimity in our advice to the public.

Industrial Welfare.

The President, Dr. Herbert Jones, in opening the discussion, referred to the pioneer work of Josiah Wedgwood (who provided houses and an open-air swimming bath for his employees) and gave the following apt quotation from his biographer: "To be comfortable himself he must know that those around him were comfortable also. To be happy he must impart happiness to others even to the most lowly of his employees. To sit at ease in his own new home he must know that those he employed were well and cosily housed. He therefore set about building a village for his workmen and their families." Wedgwood's works were established in 1767.

Dr. W. F. Dearden (M.O.H. Port of Manchester and Certifying Surgeon) contributed a useful paper, giving an epitome of the multifarious activities included under the term "industrial welfare work." The war had been a great stimulus to this work. If properly applied industrial medicine could bring about an immense saving in lost time through industrial convalescence and through the better suiting of a worker to his job. There would, perhaps, never be the same demand for whole-time works doctors as there was in America, although he had no doubt that industrial welfare work had come to stay, and that there was a great future before it.

Dr. McKail said that for adult men good working conditions and wages were the chief need. For young persons and women at all ages industrial welfare was a necessity. For boys and girls an officer was needed to make adjustments in their working conditions. The elder children of a working-class family were especially likely to be under-fed, and needed careful supervision.

Dr. G. T. Willan (Carr and Co., Carlisle) said a whole-time works doctor was good for a medium-sized firm like his, which employed from 2500 to 3000 workers. At first his appointment was viewed with suspicion by the panel doctors, but they soon found there were no grounds for that view. By immediate treatment of illness and slight injuries, employees were prevented from going on the sick list. If they had to go sick a note was sent to the panel doctor. A works doctor was no good without a proper welfare department. The system reduced absenteeism, promoted good feeling, and filled the gap in medical supervision between the ages of 14 and 16. There was a great decrease also in compensation, and it was frequently possible to find suitable jobs for injured workmen who, without such a system, would be off work for prolonged periods.

Dr. T. W. Sinclair (Melbourne) was impressed with the arrangements made in some of the American factories for recommending sound dietaries to their employees. Sometimes also there was a free distribution of milk.

Mr. George Armstrong (Bradford Dyers Association) said the Runciman Act of 1910, with regard to choice of employment, was not properly worked. The Day Continuation Schools Act of 1918 was not yet in operation. Many a boy obtained employment who was not physically fit for it, and many a man was not properly fed for his job. Diet was very important. The health records were not yet transferred from the schools to the factories. In this movement it was essential to have the workers with them.

Miss Shute (Listers, Bradford) said the 14 to 16 year olds were a great difficulty. The child comes to work in good health but great physical deterioration takes place in the next three years.

Mr. Reginald J. McKay (Bradford Dyers Association) mentioned that at one of their Bradford works a new ophthalmic service had been instituted. The firm provided plain glasses, and if the workers wanted more elaborate ones they paid the difference. As an example of the need for this service they found that in the past they had spent futile years in trying to train colour-blind workers. There was a considerable movement for vocational and psychological tests. There must be coöperation as to the medical and psychological examinations.

Dr. J. J. Robb (Bournville) said there was a tendency in America now to realise that one may over-coddle. Only a small percentage of the employees took advantage of the playing fields and facilities for recreation. In some way the factory doctor must be made independent of the firm in order to get the best results. The independence of the worker must be encouraged. Industrial welfare work should be a national responsibility. The worker is fearful of becoming a mere cog in the machine.

Dr. T. Watts (Manchester) regretted that compulsory industrial welfare had not been included in the new Factory Bill.

The trend of the discussion was to emphasise the importance of, and great future before, the movement, coupled with a note of warning against over-paternalism. A noteworthy feature of the discussion was the part taken in it by the trade representatives.

SECTION OF ORTHOPÆDICS.

Friday, July 25th.

This section met on one day, with the President, Mr. R. C. Elmslie, in the chair, to discuss the

Treatment of Hallux Valgus and Rigidus.

Sir Robert Jones (Liverpool), who opened the discussion, referred first of all to some points in the ætiology of the disabilities under consideration. In his opinion, boots were the exciting cause of the vast majority of cases of hallux valgus. He contrasted the primitive foot as seen in the infant, or the adults of barefooted races, with the foot of the average civilised individual. In hallux rigidus, whilst static causes might operate in the production of the deformity, injury was usually a dominant ætiological factor. Patients rarely sought aid because of deformity alone, but usually owing to progressive pain and discomfort. On careful examination the actual causes of the pain complained of were found to vary in different individuals—e.g., (*a*) inflammation of the bursa, (*b*) arthritis, (*c*) osteophytic pressure on the digital nerves, (*d*) callosities under the joint. An appreciation of such distinctions was necessary in order that appropriate treatment might be applied.

Treatment of hallux valgus was considered under three heads: (1) Preventive.—When a patient asked for advice in the postural stage of the deformity, he was instructed to wear shoes built on correct lines. Operative treatment was rarely if ever desirable for æsthetic reasons alone. (2) Mechanical.—It is essential to relieve the joint from pressure and this could be ensured by the simple device of placing a transverse bar of leather across the sole just behind the metatarso-phalangeal range. In addition it is advisable to tilt the inner border of the heel as in the case of simple flat-foot. Where the bursa was inflamed complete rest was prescribed. In many patients conservative methods brought about the relief of the major symptoms, and operation was not required. (3) Operative.—The choice of the operation should be decided by the special circumstances of the case. In the milder cases simple division of the joint capsule and the extensor proprius hallucis tendon, with or without cuneiform osteotomy of the neck of the metatarsal, would often suffice. Where the symptoms were entirely referable to the bursa, exsection of the sac and the underlying exostosis was necessary. Excision of the head of the metatarsal was an operation of great value, which should be reserved for patients of middle age with arthritic changes, but in exceptional circumstances might be practised in younger individuals. In the latter the weight-bearing portion of the head should always be left. Resection of the base of the first phalanx was an operation which might be regarded as a valuable alternative.

Treatment of hallux rigidus.—For this condition the operation of choice was removal of the base of the first phalanx. After all operations it was necessary to give a period of treatment directed towards the development of the musculature of the foot.

Mr. E. LAMING EVANS (London), who followed, laid stress on the importance of focal sepsis as an ætiological factor in hallux valgus. He advocated, and practised regularly, the operation of excision of the metatarsal head. There was no interference with the stability of the foot if the stump of the neck was brought to rest on the sesamoid bones. Mr. Evans regarded the post-operative re-education of the foot musculature as an essential part of the treatment.

Mr. D. MACRAE AITKEN (London) supported the view that the deformation began in early life and was due to static errors. Contrary to general experience he had found that the operation of cuneiform osteotomy of the neck of the first metatarsal was followed by good results.

Mr. NAUGHTON DUNN (Birmingham) agreed that it was necessary to institute a careful inquiry as to the exact causation of the pain. He recognised two main types of case: (a) Where the pain was due to pressure; in these, trimming of the metatarsal head was sufficient. (b) Pain due to joint movement only. Here he practised excision of the metatarsal head, or of the base of the phalanx, according to the age of the patient.

The PRESIDENT expressed his belief that compression of the forefoot in improper shoes was the outstanding factor in the ætiology of hallux valgus and rigidus. Re-education of the smaller foot muscles was therefore an integral part of all treatment. In the choice of an appropriate operation, every case had to be judged on its merits. In his experience the best results had followed complete excision of the metatarsal head, or in less severe cases, trimming of the head. After this operation the foot should always be strapped so as to support the anterior metatarsal arch.

Mr. P. BERNARD ROTH (London) emphasised the part played by the following ætiological factors:—(1) tight socks in children; (2) trauma; (3) heredity; and (4) infection. He favoured the operations of simple trimming of the metatarsal head or complete excision.

Mr. W. ROWLEY BRISTOW (London) stated that a survey of the results of the cases operated on in his clinic had shown that excision of the metatarsal head gave exceedingly good functional results. He was less satisfied with the results obtained after the operation of simple trimming.

Dr. G. HOLMES (Harrogate), who confined his remarks to conservative treatment, laid emphasis on the value of paraffin baths for the subjective symptoms of pain and discomfort.

The Operative Treatment of Arthritis Deformans of the Large Joints.

Mr. HERBERT FRANKLING (Harrogate) read a short communication on the results obtained in a personal series of operations on the hip- and knee-joints in cases of arthritis deformans. The cases were carefully chosen and the operations were conducted only after a long period of medical treatment. He stated that it was important to approach each operation as an exploratory procedure with no fixed routine in mind, the actual technique being determined after a careful inspection of the interior of the joint had been made. His results had been carefully analysed and it was gratifying to know the degree of comfort and mobility which had developed in a number of cases after comparatively conservative operative measures.

Acute Arthritis of the Hip.

Mr. S. T. IRWIN (Belfast) described a series of cases of acute arthritis of the hip-joint in which mechanical problems of considerable difficulty were presented in the later stages. He pointed out that if in this condition and similar acute infections early correct splinting and postural treatment had been employed, many of the later difficulties would never have arisen.

Lesions of the Ulnar Nerve in the Region of the Elbow.

Mr. HARRY PLATT (Manchester) dealt with some points in the pathogenesis and treatment of certain forms of ulnar nerve lesion in the region of the elbow, which he divided into three classes: (1) Lesions associated with recent fractures of the lower end of the humerus. An ulnar nerve lesion accompanying a fracture of this type was an uncommon complication, and usually was a transitory phenomenon. If the signs of severe neuritis persisted operation was indicated, and the nerve should be displaced to the front of the elbow. (2) Late involvement of the ulnar nerve. For this condition, in which various types of reconstructive operations had been practised, the operation of anterior transposition of the nerve was also effective. (3) Recurring dislocation of the nerve. Here again the operation of anterior transposition should be regarded as a routine procedure.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

BRIEF mention has already been made of the very varied and complete exhibition of surgical instruments, appliances, drugs, foods, and other objects of medical interest, which was held in the Windsor Halls, Morley-street, Bradford, from Tuesday, July 22nd, until Friday, July 25th. The educational value of such an assemblage was the subject of Mr. Basil Hall's remarks when, as President of the Association, he opened the exhibition, and the attendance throughout the week showed that his view was taken by many of those who were attending the meetings.

SURGICAL INSTRUMENTS AND APPLIANCES.

The exhibit of surgical instruments, general and special, was as full and instructive as in recent years, with a number of ingenious contrivances of the last 12 months added. [49] Allen and Hanburys, Ltd. (Bethnal Green, London, E.C. 2): an extensive surgical exhibit, including a model of the new St. Bartholomew's Hospital pattern operation table, the minimum height of which has been reduced to 32 inches, and which includes a new arm-rest for support during removal of axillary glands, and an arm-support for use in the kidney position. Among other recent models were the latest pattern of Boyle's gas, oxygen, and ether apparatus, insulin syringes as made for Dr. Leyton, the newest forms of blood-transfusion apparatus, and sets of electrically illuminated diagnostic instruments.—[6] Arnold and Sons (John Bell and Croyden, Ltd., 50, Wigmore-street, London, W. 1): an improved operation table, at a moderate price, on an oil-pump base, the whole control of which is from the head end of the table, within the surgeon's easy reach; also a new self-retaining abdominal retractor, designed by Mr. H. B. Devine, of Melbourne, giving an extensive view of the field of operation.—[44] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1): a large and representative collection of surgical instruments and appliances, including recent introductions and modifications suggested by surgeons, many of the instruments being made in stainless steel—e.g., Childe's crushing clamps and forceps; Fraser and Dott's guillotine for aseptic intestinal anastomosis; Ryle and Einhorn's tubes for gastric and duodenal analysis; instruments for lung surgery by Duval, Tuffier, and de Quervain.—[27] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C. 1): an exhibit covering most branches of modern surgery, of special interest being a pocket record syringe to be readily carried about, sterilised in a water-tight container, and a simple and ingenious form of pantoscope, both listed at very moderate price.—[25] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments and apparatus of original design for general and regional surgery, including a very practical form of blood-pressure outfit with arm-band and dial; and Daniell's apparatus for administration of warmed ether vapour. An extremely rigid operating table by this firm is on view at the Wembley Exhibition. Point was made of an absolutely boilable silk of unbleached fibre.—[54] Reynolds and Branson, Ltd. (Leeds): a large exhibit of special instruments, including those used by Sir Berkeley Moynihan in abdominal surgery, most instruments being in stainless steel, not excepting the knives themselves. A set of apparatus and solutions designed for the use of the general practitioner in the diagnosis of glycosuria and diabetes. —[24] C. F. Thackray (Gt. George-street, Leeds, and 119, High Holborn, London, W.C. 1): a collection of abdominal and surgical instruments, including Rufus Harris's extension apparatus with a spring balance up to 25 lb. applicable to any Thomas's splint, obviating the use of pulleys and uprights, and not pinning the patient down to the bed.—[2] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): besides a complete display of instruments, including many new and original designs, a very practical projection lamp for throwing on the screen any microscopic slide and giving a 7-foot disc in a dark room with an ordinary wall-plug attached to a lighting circuit. Also a new epidiascope with no filament.

Among the special instruments:—[15] Ajax Electro-Medical Apparatus (117, Central-street, London, E.C. 1): with special emphasis on a new sinusoidal generator requiring only a little water from the tap to render it capable of furnishing a wide range of currents for treatment.—[20] Ardente Acoustique (Mr. R. H. Dent, 95, Wigmore-street, London, W. 1): in addition to a series of apparatus for the relief of deafness characterised by absence of adventitious sounds and metallic timbre, a stethoscope specially designed for doctors suffering from deafness, and a church installation rendering it possible for deaf people to hear the service from any part of the building.—[3] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1): the latest form of apparatus for giving radiant heat treatment by means of luminous rays, with a bed of new design and simpler construction.—[36] The Genito-Urinary Co., Ltd. (64, Great Portland-street, London, W. 1): a selection of cystoscopes, urethroscopes, bronchoscopes, œsophagoscopes, of various types, including the latest improvements and the inventions for diagnosis and treatment associated with the names of Thomson-Walker, Swift Joly, Frank Kidd, A. C. Morson, and others.—[32] Theodore Hamblin, Ltd. (15, Wigmore-street, London, W. 1): a number of ophthalmic instruments, including a new luminous Morton ophthalmoscope to be used with both the direct and indirect methods, and a new prismatic binocular loupe giving a large flat field with three magnifications.—[43] Rayner and Keeler, Ltd. (dispensing opticians in London, Bradford, Liverpool, Leamington, and other towns. Works: Kemp Town, Brighton): a luminous ophthalmoscope with standard Morton body and improved May type of illumination; an operating lamp with triple beam mounted on adjustable sling support; and a new fitting of the Moorfields lamp giving an intense beam for needling which can be used also as a slit lamp.

Besides those firms mentioned as supplying dressings:—[47] Antiphlogistine (Denver Chemical Manufacturing Co., London, E.C. 3): the well-known hygroscopic antiseptic poultice for use in inflammatory and congested conditions both superficial and deep-seated.—[34] Thermogene Curative Wadding (The Thermogene Co., Ltd., Haywards Heath, Sussex): a scientifically prepared cotton-wool impregnated with various medicinal essences, intended to stimulate gently the circulation in the affected part.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

The collection of drugs and pharmaceutical preparations was, as usual, large and representative, containing for the most part new and improved forms of well-tried remedies rather than a host of new synthetic drugs. [49] Allen and Hanburys, Ltd. (37, Lombard-street, London, E.C. 3): the pharmaceutical section of this firm's exhibit included insulin A.B. brand, with a special set of apparatus and reagents for the estimation of blood-sugar by Maclean's method; the various forms of Allenburys foods for infants, and diabetic flour; numerous polyglandin preparations and osmokaolin prepared by electro-osmosis, in colloidal form, for the treatment of intestinal toxæmias.—[55] Boots Pure Drug Co., Ltd. (Station-street, Nottingham): amongst a large exhibit of fine chemicals, tablets, pastilles, tinctures, were specially to note insulin, acriflavin, stabilarsan, and chloramine T. Details were available of the strict system of analyses made by expert chemists in the firm's laboratories before the use of any raw material, of the running control during manufacture, and examination after packing.—[46] C. J. Hewlett and Son, Ltd. (35, Charlotte-street, London, E.C. 2): a number of well-established original preparations, including deliciol, a coloured and flavoured soft paraffin; evapogens, a medicated evaporating skin lotion; iodermiol, a non-irritating preparation of iodine; and Dr. Crofton's human tubercle bacillus solution on which demonstrations were being given.—[56] The Hoffmann La Roche Chemical Works, Ltd. (7, Idol-lane, London, E.C. 3): besides the well-tried sedobrol, in tablet form for preparing a hypnotic bouillon, and omnopon in various forms, a new non-narcotic, non-habit-forming hypnotic and analgesic was shown bearing the name allonal, coming with recommendation from the Jefferson Medical College, and spasmalgin, a combination of omnopon, papaverin and atrinal, for relieving pain in dysmenorrhœa and colicky conditions.—[38] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): besides the palatinoids, bipalatinoids, pulverettes, and various roboleine compounds, an oxygen generator and oxinhalator, providing oxygen gas from chemical cubes in a high state of purity, for use in country districts and under circumstances where cylinders of compressed gas are not available.—[50] Parke, Davis and Co. (50, Beak-street, Regent-street, London, W. 1): in addition to a large variety of pharmaceutical and toilet preparations, bacterial vaccines prepared in the Department for Therapeutic Inoculation at St. Mary's Hospital, anti-diphtheritic serum containing 1400-1500 units per c.cm, Dr. Owen F. Page's tuberculin insufflation outfit, as well as hæmoplastin, a sterile fluid for venous injection, reducing the coagulation time of the blood.—[54] Reynolds and Branson, Ltd. (Leeds): among a large exhibit in this class, concentrated emulsions for making medicated waters more cheaply than on a spirit basis; unguentum sedativum R. & B., a healing and antiseptic ointment containing calamine and pitch, of proved utility in many skin affections.—[4] Sandoz Chemical Co., Ltd. (Canal-road, Bradford): scillaren, femergin, felamine, and ipecopan in tablet form, as well as a useful dietetic and digestive biscuit known as matinol, incorporating highly refined petroleum to the extent of some 20 per cent., an elegant regulative medium.—[14] E. R. Squibb and Sons (80, Beekman-street, New York): thromboplastin, a lipoid prepared from the brain of the ox, by Dr. A. F. Hess's method; and thyroxin, a physiologically active ingredient of thyroid, containing 65 per cent. of iodine.—[40] W. A. Wharram, Ltd. (31, Lady-lane, Leeds); a series of popular pepsin preparations, the digestive ferment being combined in various ways with bismuth, nux vomica, strychnine, iron and aromatics; various elixirs including a cardiac tonic, luminal, compound senecio and viburnum; and a number of original mixtures and syrups.—[29] Wyleys, Ltd. (Coventry): among other pharmaceutical specialities, an emulsion of acetyl-salicylic acid, 5 grains to 1 drachm, pleasant to take and acting quickly, and a compound theocin mixture, containing 1 grain of theocin-sodium-acetate to the drachm.

A number of special pharmaceutical preparations were shown. [48] Armour and Co., Ltd. (Queen's House, Kingsway, London, W.C. 2): beef cubes, claimed to have a more intensive beef flavouring than any other cube on the market, and an exhibit of endocrines comprising tablets, capsules, powder and liquids, including a pituitary liquid prepared to a physiological standard.—[23] Crookes' Collosols (The Crookes Laboratories, 22, Chenies-street, London, W.C. 1): in additon to argentum, bromide, calcium, ferro-malt, iodine, kaolin, and sulphur in a colloid form, also collosol ichthyol in ointment and capsules, obtained solely from British shale.—[35] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): the well-known effervescent saline laxative, containing no crude mineral substance and free from sugar.—[51] Genatosan, Ltd. (Loughborough): nasmin, a germ-killing snuff; sanatogen, the well-known tonic food; formamint, to combat mouth and throat ailments; and a collection of detoxicated vaccines claimed to be 50 to 100 times less toxic than ordinary vaccines.—[53] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C. 4): preparations of cyllin, a non-irritant and non-caustic antiseptic with a Rideal-Walker coefficient for *B. typhosus* of 22 to 26; also a form of lysol (jeysol) for use when a clear solution in water is required.—[18] The Anglo-American Oil Co., Ltd. (Albert-street, Camden Town, London, N.W. 1): nujol, an intestinal lubricant manufactured to a standard viscosity, approved by clinical and chemical tests; and mistol, an oily solution for use in an atomiser along with camphor, menthol or eucalyptol.

Apart from the firms already mentioned, toilet preparations were shown by: [42] Kolynos, Incorporated (Chenies-street, London, W.C. 1): an antiseptic dental cream not interfering with the normal secretions of the mouth and free from grit.—[22] The Pepsodent Company (42, Southwark Bridge-road, London, S.E. 1): a dentifrice containing mildly acidic calcium salts stimulating the secretion of saliva; and the decoater tooth-brush designed for use therewith, in convenient pocket forms for travelling.

FOOD PREPARATIONS.

Foodstuffs and food accessories were represented by a large number of separate exhibits. [59] Cadbury Bros., Ltd. (Bournville, Birmingham): the usual exhibit of Bournville cocoa and chocolates, conforming to the highest standards of purity and uniformity.—[13] Food Education Society (329, Vauxhall Bridge-road, London, S.W. 1): publications on dietetics and hygiene, including The Gateway of Health, Facts for Patriots, Feeding of Children, Diet in Pregnancy, and a new pamphlet on Puddings and Porridge. The Society, which is undogmatic and philanthropic, sets out to educate the public in matters of food, cookery, and health.—[26] Food Products, Ltd. (11, Queen Victoria-street, London, E.C. 4): an exhibit of bovo-lactin in various forms, a product rich in assimilable animal protein, iron, and with a high vitamin content. Diluted with soda water it is recommended as a refreshing and stimulating drink for summer sports such as tennis.—[67] William Gaymer and Son, Ltd. (Attleborough, Norfolk): various brands of Gaymer's cyder, prepared from Norfolk apples, including the original "dry" brands which have received favourable medical comment.—[57] Glaxo (J. Nathan and Co., 56, Osnaburgh-street, London, N.W. 1): standardised dried milk products, including Prescription Glaxo, a new humanised form with a normal fat, low protein, and high carbohydrate content, particularly suitable in the early weeks of infant life and in cases of difficult assimilation, malnutrition, constipation, and so forth. When reconstituted with hot boiled water, 1 in 8, a milk is obtained with protein content as low as that of human milk—namely, 1·7 per cent. A report is available from a London hospital where since December, 1923, 15 infants have been fed upon it with satisfactory results. In no case did the milk cause vomiting, diarrhœa, or constipation, and in no case did the infants fail to gain in weight.—[45] Horlick's Malted Milk Co. (Slough): recommended as an ideal food from infancy to age, and as filling a useful place in Red Cross work for the ease with which it is prepared; also available in the form of food tablets.—[52] Milkal, Ltd. (31, St. Petersburgh-place, Bayswater, London, W. 2): a dried milk produced in a modern creamery from milk of Devonshire herds, under the supervision of inspectors, the drying being controlled by qualified chemists. The powder does not contain pathogenic organisms, and the number of other organisms remaining is low. It is claimed that there is hardly any coagulation of albumin, and that the calcium-casein balance is undisturbed.—[63] Numol, Ltd. (Newcastle-on-Tyne): a dietetic preparation containing malted carbohydrates, proteins, fat, lecithin, glycerophosphates, hypophosphites, diastase, and lemon; originally known in northern hospitals as "extractum nutriens," and containing 12·5 per cent. of animal fat. Also a non-irritant, non-poisonous antiseptic known as soloform, with the formula $C_6H_2I_3OH$, which can be used undiluted and is available in special form for immediate sterilisation of surgical instruments.—[30] Oxo, Ltd. (Thames House, Queen-street-place, E.C. 4): Oxo fluid beef, being a concentrated form of stimulating extractives together with easily digestible constituents of fresh, lean beef, seasoned ready for use, as well as Lemco, a pure unseasoned beef extract and beef essence for invalids and convalescents; also Oxoid brands of gland extracts, including thyroid, pituitary, and adrenal, in tablet form.—[33] Prideaux's Pure Casein Co., Ltd. (16, Southwark-street, London, E.C. 1): the Dorsella milk food, described as modified full-cream milk dried within a few hours of milking, with the addition only of lactose; half-cream milk powder for special prescription is also supplied. Casumen contains nearly 90 per cent. of casein and is completely free from starch and sugar.—[28] Virol, Ltd. (Hanger-lane, Ealing, London, W. 5): containing fats, carbohydrates, and proteins in well-balanced proportions and abundance of vitamins not destroyed in the process of manufacture; also virolax and the new virol and milk in golden powder, combining the properties of virol with full-cream Devonshire milk, and recommended for nervous and mental fatigue and for athletes in training.

MEDICINAL AND MINERAL WATERS.

[60] Bath (Mr. John Hatton, Director of Baths): an exhibit of photographs of the bathing establishments and water-colours of features of interest in and around Bath, with a special reference to the coming annual meeting of the Association at Bath in 1925.—[21] Droitwich (Mr. J. H. Hollyer, Joint General Manager of Bathing Establishments): a spa dependent for its therapeutic claims upon natural water only, the heavy brine constituting the strongest saline water known and facilitating the movements of immersed limbs; highly radio-active and radio-emanative.—[39] Harrogate (Mr. F. J. C. Broome, General Manager): unique in the diversity of its springs, with 87 waters each possessing distinctive characteristics, and under the supervision of a permanent scientific officer and analyst. The bathing equipment was visited by many members during the annual meeting of the Association.—[58] Ingram and Royle, Ltd. (45, Belvedere-road, London, S.E. 1): samples of imported natural mineral water, salts, and pastilles, including Vichy-Celestins, Contrexéville-Pavillon, Evian-Cachat, Hunyadi-János, Carlsbad sprudel salt, and 22 others.

MICROSCOPES AND SCIENTIFIC APPARATUS.

[19] Baird and Tatlock, London, Ltd. (14, Cross-street, Hatton Garden, London, E.C. 1): an impres-

ive exhibit of autoclaves, incubators, centrifuges, sterilisers, glass apparatus, stains, and media, including apparatus for determination of sugar in blood, Harris's air analysis, and an all-British Benedict metabolism apparatus.—[9] C. Baker (244, High Holborn, London, W.C. 1): a collection of microscopes and accessories to meet the needs of the student, advanced student, and research worker; also a new corneal magnifier and illuminator, with possible application to other clinical purposes.—[10] F. Davidson and Co. (29, Great Portland-street, London, W. 1): a variety of optical and electro-medical appliances and portable outfits for examination of the ear, nose, and throat, trans-illumination and cautery; also a new pharyngoscope on the principle of the cystoscope.—[7] Chas. Hearson and Co., Ltd. (47, Mortimer-street, London, W. 1): sole agents in Great Britain for Reichert microscopes and accessories; in addition to bacteriological apparatus, such physiological apparatus as kymographs, recording drums, respirator pumps, time-marking clocks, myographs, hæmocytometers, and so forth. This firm submits designs and carries out manufacture of apparatus for new experimental work.—[5] Kodak, Ltd. (Kingsway, London, W.C. 2): showing duplitised X ray films, positive prints on nikko-bromide paper, and reduced transparencies on Eastman commercial film; a series of very beautiful radiograms.—[62] Ronuk, Ltd. (Portslade, Sussex): materials and appliances employed in the preparation, initial polishing, and maintenance of floor and other interior woodwork by improved sanitary methods.—[65] Short and Mason, Ltd. (Aneroid Works, Walthamstow, London, E. 17): the Tycos sphygmomanometers, calibrated to standard readings and self-verifying.

Medical Agencies.

[1] The Medical Charities: Royal Medical Benevolent Fund and Epsom College.—[37] The Medical Insurance Agency (429, Strand, London, W.C. 2): founded in 1907 to persuade medical men to protect themselves by means of insurance against adverse fortune and unsatisfactory contracts, and to assist the medical charities.—[11] The Medical Sickness, Annuity, and Life Assurance Society, Ltd. (300, High Holborn, London, W.C. 1): founded in 1884 as a mutual society of medical and dental practitioners, with the object of obtaining sickness, accident, and life assurance on better terms than are offered by proprietary companies.

Books and Office Accessories.

[31] H. K. Lewis and Co., Ltd. (136, Gower-street, London, W.C. 1): an exhibit of new and important books in many branches of medicine, including those of the Cambridge University Press; additions to the stock of medical stationery—e.g., new cards for X ray treatment and electrical treatment in the card index system. The printed library catalogue has been kept up to date by two supplements, 1918–20 and 1921–23.—[16] The Oxford University Press (Warwick-square, London, E.C. 4): a set of the Oxford Medical Publications, comprising text-books and works on medical, surgical, and allied subjects, and several recent and important additions.—[12] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): a collection of the latest publications of Messrs. F. A. Davis Co., Philadelphia, E. and S. Livingstone, Edinburgh, and Cassells, London: including the Practical Medicine Series of Year-books on general medicine, surgery, and special subjects.—[64] W. B. Saunders Company, Ltd. (9, Henrietta-street, London, W.C. 2): a number of new books and new editions, including Pædiatrics by 150 authorities: Operative Surgery, edited by W. S. Bickham, in four volumes, and other standard books.—[17] Tapp and Toothill, Ltd. (Bradford): a set of office indispensables, including the ingenious Bates rotary telephone index.—[41] John Wright and Sons, Ltd. (Bristol): a series of new publications, including Epidemic Encephalitis, by Prof. A. J. Hall; Diseases of the Nose, Throat and Ear, edited by Dr. A. Logan Turner; and new editions of standard medical works.

Corrigendum.—In our report of the Section of Ophthalmology (THE LANCET, August 9th, p. 295, col. 1, five lines from the bottom) the sentence should read: "The beam should be directed at a suitable angle so as to avoid the *specular reflection from the* corneal epithelium."

Correspondence.

"Audi alteram partem."

THE VIRUS OF FOOT-AND-MOUTH DISEASE.

To the Editor of THE LANCET.

SIR,—The photographs of the colonies and of the individual organisms of the virus of foot-and-mouth disease reproduced in THE LANCET of August 2nd will no doubt be of interest to many workers in bacteriology and allied sciences. In common with most English references to this recent discovery, the description you give is not quite accurate. The photo-micrographs have been obtained by using ultra-violet light as an illuminant, but the apparatus used is not the ultra-microscope as might be inferred from your article. An ordinary type of microscope was used, but it is fitted with objectives and condensers of quartz. The light source is provided by passing a high tension electric discharge between cadmium electrodes, the desired wave-length in the ultra-violet (275 μμ) being isolated spectroscopically.

No doubt the similarity of the terms "ultra-violet microscopy" and "ultra-microscopy" has led to some confusion, but the purpose of the two methods is widely different. The terms themselves are perhaps open to objection, but as they are in general use and are recognised by microscopists as applying to different branches of work, it is difficult to alter them. Any confusion in their use is probably due to failure to appreciate that there are two distinct microscopical methods. In one the aim is to obtain the utmost resolution, in the other to obtain the greatest visibility. Resolution is dependent on the wave-length of the light used and on the numerical aperture of the objective, whereas visibility is mainly dependent on the intensity of the illuminant. Resolution is the desideratum in all ordinary observational work with the microscope and the use of ultra-violet light comes within this category, although the image itself is invisible and has to be recorded photographically. The difference between the use of white light in which the dominant wave-length is of the order of (say) 550 μμ and ultra-violet light of wave-length 275 μμ, is that resolution is doubled, such increase of resolution proceeding regularly as the wave-length used is reduced. Thus objects of half the size of those seen by white light may be satisfactorily shown.

The organism of foot-and-mouth disease is presumably of the order of size that can be photographed in ultra-violet light (about 0·1 μ), while it would be impossible to resolve it by any method in which white light is used. The method has other and perhaps even greater advantages for biological work, as organisms do not require any preparation before being photographed; they can be dealt with in the living state. Now the ultra-microscope secures increased visibility, and there is no theoretical limit to the size of an isolated object that can be made visible by this means; it is in general merely a question of whether the object can be made sufficiently luminous to be seen. The light used is therefore of high intensity, usually an arc-light or sunlight, and illumination is at right-angles to the direction of observation. The image obtained of a small particle is a circular disc of light giving no indication of its shape or size. It follows, therefore, that this method is of limited application, and it is in practice confined to the observation of colloidal particles. The ordinary dark-ground illuminator is a particular form of this apparatus limited in its scope to the observation of objects within the resolving power of the objective used. The organism of foot-and-mouth disease could not, therefore, be identified by this method from inanimate particles of the same order of size. Indeed, there is no suggestion in the original papers by Frosch that the ultra-microscope has been used in the researches which have led to the discovery of the virus of foot-and-mouth disease.

I am, Sir, yours faithfully,

August 9th, 1924. J. E. Barnard.

INTOLERANCE TO A DENTURE.

To the Editor of The Lancet.

Sir,—In reply to Dr. H. St. A. Agate it is quite possible to have a narrow upper denture attached by springs to the lower. By this means the upper is maintained in position with nothing to irritate the palate.

I am, Sir, yours faithfully,

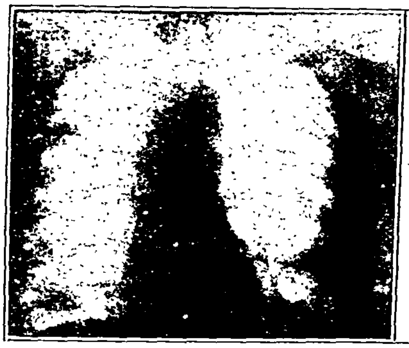
W. Rushton.

Harley-street, W., August 9th, 1924.

SELECTIVE COLLAPSE IN ARTIFICIAL PNEUMOTHORAX.

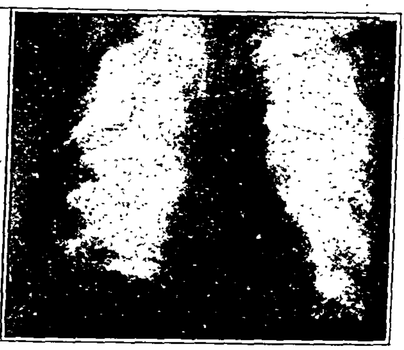
To the Editor of The Lancet.

Fig. 1.



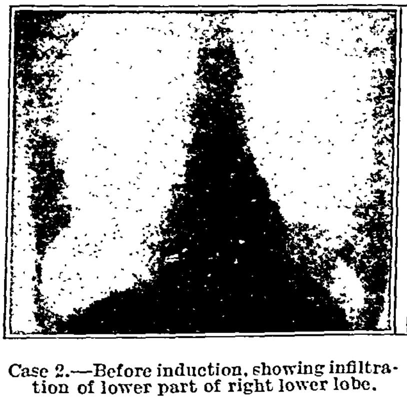
Case 1.—Before induction, showing infiltration of right upper lobe.

Fig. 2.



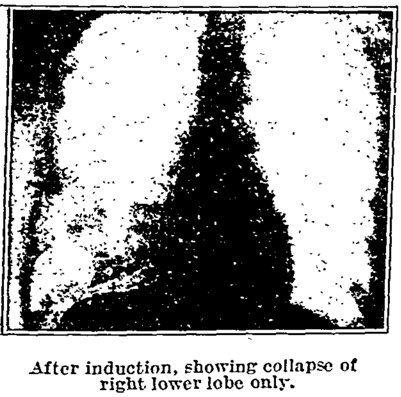
After induction, showing collapse of right upper lobe only.

Fig. 3.



Case 2.—Before induction, showing infiltration of lower part of right lower lobe.

Fig. 4.



After induction, showing collapse of right lower lobe only.

Sir,—In April, 1922, Nathan Barlow and David Kramer published in the *American Review of Tuberculosis* a preliminary report upon selective collapse under partial pneumothorax. They discussed what appeared to them to be some of the shortcomings and disadvantages of artificial pneumothorax treatment as it is practised to-day; and they also pointed out that if small quantities of air are introduced into a free pleural cavity containing a lung only partially infiltrated with tuberculosis, the air so introduced will tend to collect over or round the diseased areas only, collapsing these and leaving the rest of the lung expanded and capable of function.

The advantages to be gained, if this selective collapse is possible, are obvious. Barlow and Kramer set them out as follows: (1) Little or no general disturbance on induction; (2) little or no general disturbance during treatment; (3) less disturbance of function if the pneumothorax was to be discontinued for any reason; (4) great widening of the choice of cases suitable for artificial pneumothorax treatment; (5) the possibility of inducing bilateral artificial pneumothorax safely and without distress to the patient.

The method seems to point a way to the solution of one of the great difficulties in the treatment of pulmonary as distinct from other forms of tuberculosis—that is, of resting the diseased organ or its diseased part. As our knowledge stands at present there are still only a small proportion of cases suitable for collapse, but this method should tend to enlarge that proportion considerably. For this reason it would have been expected that the publication of this work would have aroused a great deal of interest among those who practise pneumothorax treatment, and it is because this does not appear to be the case that I am emboldened to publish the fact, that by following out the technique laid down in the original article I have, during the last two years, been able to confirm Barlow's and Kramer's results in general. Further, that small quantities of air carefully introduced into a relatively free pleural cavity will produce selective collapse of the diseased areas only, and that in suitable cases all the advantages claimed actually occur.

The method has not in my hands given 100 per cent. successes, but the results have been so very striking and encouraging that I have felt it worth while to spend a great deal of time in studying and practising it. I hope that this short account, with the accompanying illustrations, will be found sufficiently interesting to persuade my colleagues to give selective collapse a thorough investigation, so that its apparently great possibilities may be developed. As I have not modified or attempted to improve upon the original technique in any important details, I do not recapitulate it here, but refer those interested to the original article.

The plates show two typical cases before and after induction. In both the air was introduced in the same place—that is, between the fourth and fifth ribs in the mid-axillary line.

I am, Sir, yours faithfully,

R. C. Wingfield, M.B., B.Ch. Oxf.,
Medical Superintendent, Brompton Hospital Sanatorium, Frimley.

August 8th, 1924.

THE STROMA OF RED CORPUSCLES.

To the Editor of THE LANCET.

SIR,—For some years I have been treating cases of acute and chronic bacterial infections by a method based on the idea that the stroma of red corpuscles, when set free into the circulation by the destruction of the cell envelope, has toxic characters, and that this cellular endotoxin is a factor in disease. Briefly stated, the hypothesis is that in bacterial infections two factors have to be considered: firstly, the specific toxin which causes the manifestations of disease characteristic of the particular bacteria concerned, and secondly, a toxic substance set free from the red corpuscles by the hæmolytic properties possessed by most, if not all, pathogenic bacteria. In malaria I believe we have a disease in which the symptoms are due chiefly or entirely to this endotoxin, set free by the disruptive effect of the parasite on the red corpuscles. The aim of the method of treatment I have employed is to immunise the body against this endotoxin by using an emulsion of destroyed red cells as an antigen, exactly as a vaccine is used to set up immunity against a bacterial toxin.

The present state of the experimental evidence is as follows: (1) The subcutaneous injection of 1 c.cm. of a suspension of red cells destroyed by heat (56° C.) is followed by a local inflammatory reaction. No reaction follows the injection of unheated red cells. (2) C. J. Bond (*British Medical Journal*, Jan. 11th, 1919) has shown that red cells destroyed by grinding in a mortar are toxic to leucocytes, as shown by arrest of emigration of leucocytes and absence of iodophil reaction. (3) Washed red cells exposed to the rays of the tropical sun are rapidly destroyed and reduced to a granular débris, the glass container being kept immersed in water to eliminate the heat factor. These experiments were carried out in India in June, 1918; I have not been able to show any destructive effect on repeating the experiment in England. (4) Complement deviation tests to demonstrate the presence of an immune body in the serum after injection of destroyed red cells and in certain diseases have been carried out for me by Dr. W. W. Mackarell, pathologist to the Leicester Royal Infirmary; the results so far obtained, though suggestive, are not convincing. An acetone extract of washed red cells has been used as an antigen. Briefly, it may be stated that the serum of patients who had received a course of injections absorbed slightly more complement than serum from the same patients before the injections were begun. The serum of a patient suffering from malaria (benign tertian, before treatment with quinine) showed constantly a greater absorption of complement than any other serum tested.

I am anxious to obtain more experimental evidence in support of the toxicity of the stroma of red corpuscles at the hands of those who have more facilities than I have for animal experiment.

I am, Sir, yours faithfully,

Leicester, August 11th, 1924. T. C. CLARE.

TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS.

To the Editor of THE LANCET.

SIR,—I read with much interest in your issue of July 26th Dr. Geoffrey Bourne's article on modern technique in the treatment of acute anterior poliomyelitis. My criticism of Dr. Bourne's treatment of this disease centres round the prominent place which he gives to massage as a curative agent, and the absence of prominence which he gives to active movements. Dr. Bourne, in my opinion, goes beyond any previous enthusiast for massage when he states that the mother is the most valuable ally in the campaign waged for recovery, and that massage is the weapon (to keep to the military metaphor) on which full reliance should be placed. The surprising statement is made that after two months the mother shoulders the whole burden, and full detailed instructions are given as to how this home massage should be carried out.

The treatment of infantile paralysis resolves itself essentially into recovery of normal motion. Any treatment of this disease must stand or fall by this test, and success can only be judged by the amount of movement obtained. Massage, in my opinion, is useless as a remedial agent for the recovery of muscle function; that is to say, it can neither initiate muscular movement nor can it increase its range or power. Massage has its function as a vasomotor stimulant, but beyond that I deny its efficiency in this disease. Dr. J. B. Mennell has stated (THE LANCET, 1924, i., 161) that "not infrequently, more harm than good is done by this treatment [i.e., massage] in cases of infantile paralysis," and again "massage assists the circulation . . . . but cannot possibly secure one single voluntary contraction."

Voluntary movement can only be initiated by the central nervous system, and gradually developed by systematic and carefully-graduated exercises. Dr. Bourne gives six lines of treatment to movements both active and passive, and would seem apparently to place very little dependence on them. In an article on "modern treatment" no mention is made of what is essentially a modern development—muscle re-education. This I consider to be modern treatment—all else is purely subsidiary treatment. In any question of the recovery of muscle function in a case of infantile paralysis it is essential to differentiate between the upper and lower limbs. An amount of movement may be obtained in the upper limbs quite sufficient to subserve good function, but the same range and amount of movement may be quite inadequate in the lower limbs, where, apart from motion, the question of weight bearing has to be considered.

In my opinion, much subsequent weakness and deformity would be prevented if strict instructions were given that no child with infantile paralysis of one or both lower limbs should be allowed to stand or walk until the expiry of 12 months at least from the onset of the disease.

I am, Sir, yours faithfully,

CHARLES MACKAY, M.D.

Wimpole-street, W., August 11th, 1924.

A BIBLIOGRAPHY OF SIR THOMAS BROWNE.

To the Editor of THE LANCET.

SIR,—The notice of Mr. Geoffrey Keynes's excellent bibliography of Sir Thomas Browne, which appeared in THE LANCET of August 9th, prompts me to ask whether a curious parallel between Browne and a writer of a very different calibre—namely, Charles Dickens—has been noticed. Both men are best known by their first book, written in their early years: in the case of Browne when he was 29, in the case of Dickens when he was 23. Again, the original MS. of Religio Medici is lost and so is the original MS. of Pickwick. Only MS. transcripts exist of the former work, of the latter a few leaves exist. Both works have been translated into various foreign languages; and the last and most striking similarity is that both works gave rise to a generous crop of imitations. The list of imitations of Religio Medici is given from No. 387 to 470*b* in Mr. Keynes's bibliography, while as for Pickwick it will suffice to mention "Pickwick Abroad," "Pickwick in India," and "The Queerfish Chronicles," among many others. Between no two books so dissimilar in date, matter, and style can, I think, the same similarities be traced.

I am, Sir, yours faithfully,

Forest Row, August 12th, 1924. H. P. CHOLMELEY.

THE LATE DR. H. L. HANNA.—At the inquest on Dr. Henry Lyle Hanna, who was killed as the result of an accident while driving a motor-car near Linzford, Newcastle, Mr. A. E. Boulton, deputy coroner, expressed his opinion that the cause of death was an accident pure and simple. At a dangerous turning of the road two tyres burst, and as Dr. Hanna swerved to avoid a ravine, the car overturned. By his action, the coroner stated, Dr. Hanna had saved the lives of the other occupants of the car. The deceased, who qualified M.B., Ch.B. Dublin in 1923, held an appointment at the Fleming Memorial Hospital for Children, Newcastle.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Summer Recess.

THE House of Commons adjourned on Thursday, August 7th, for the summer recess until Oct. 28th. A resolution was passed empowering the Speaker, after consultation with the Government, to cause the House to meet at any earlier time if thought necessary in the public interest. The House of Lords adjourned until Sept. 30th. The Royal Assent was given by Commission to a number of Acts, including the National Insurance Act and the Workmen's Compensation (Silicosis) Act.

HOUSE OF COMMONS.

WEDNESDAY, AUGUST 6TH.

Local Authorities and Birth Control.

Mr. **THURTLE** asked the Minister of Health if new legislation was necessary before local authorities could be authorised to give information concerning birth control at maternity centres.—Mr. **WHEATLEY** replied: The question whether further legislation would be required is not free from doubt, but in any case, as I have already informed the hon. Member, I am not prepared to sanction the use of maternity centres for so controversial a purpose without express direction by Parliament.

Pensions Medical Officers and Overseas Service.

Lieut.-Colonel **FREMANTLE** asked the Minister of Pensions whether he was satisfied that, in selecting medical officers for discharge from his department, those who had not served overseas were discharged before those who, if equally efficient, had served overseas; and whether he was satisfied that no medical officer without overseas service was retained in a position for which an officer with overseas service was eligible and equally suitable.—Mr. F. O. **ROBERTS** replied: The answer to both parts of the question is in the affirmative, subject always to the paramount consideration of efficiency of the public service.

An Industrial Medical Service.

Captain **REGINALD TERRELL** asked the Secretary of State for the Home Department if it was the intention of the Government to establish an industrial medical service; and, if so, with what object.—Mr. **HENDERSON** replied: Provision is made in the Factories Bill for the amendment and extension of the existing system of medical examination of young persons for factory employment on the lines recommended in the report of the recent Departmental Committee (Cmd. 2135).

THURSDAY, AUGUST 7TH.

Male Inspectors of Physical Education.

Colonel Sir **CHARLES YATE** asked the President of the Board of Education how many male inspectors of physical education were now employed, and how many hours a week were devoted to the physical education of boys in elementary and secondary schools, respectively.—Mr. **CHARLES TREVELYAN** replied: There are at present one male staff inspector and two other male inspectors of physical training employed by the Board. Neither the code nor the regulations for secondary schools prescribe the number of hours in each week that thould be devoted to physical exercises. In public elementary schools the time varies, as a rule, from one to one and a half or two hours. In secondary schools one or two periods a week are generally given to physical exercises, in addition to any time given to organised games.

Health of the Unemployed.

Mr. **WILLIAM THORNE** asked the Minister of Health whether he had any information regarding the health of the unemployed men and women who had been out of employment for a lengthy period; and whether the percentage of illness of such men and women was higher than those persons regularly employed.—Mr. **WHEATLEY** replied: The expenditure by approved societies on sickness benefit under the National Health Insurance Acts affords some indication of the amount of sickness of all kinds amongst the insured population of the country, but the material in their possession does not make it possible to state whether the percentage of sickness is higher in the case of persons who have been out of employment for a lengthy period than in the case of persons regularly employed. Taking the insured population as a whole, there is no evidence that the prevalence of unemployment has adversely affected the claims for benefit under the Acts.

Medical News.

UNIVERSITY OF LONDON.—At a meeting of the Senate, held on July 23rd, the following teachers were recognised as teachers of the University, in the under-mentioned subjects: Mr. Frank B. Bull, orthodontics (Guy's Hospital); Mr. Frederick N. Doubleday, dental materia medica (Guy's Hospital); Mr. William K. Fry, dental prosthetics (Guy's Hospital); Mr. Frank J. Pearce, operative dental surgery (Guy's Hospital); and Dr. Ida S. MacLean, biochemistry (Lister Institute of Preventive Medicine).

St. Mary's Hospital Medical School.—The University scholarships at St. Mary's Hospital Medical School have been awarded to T. C. Hunt, Magdalen College, Oxford, and D. N. Rocyn-Jones, Downing College, Cambridge.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination in Medicine, Surgery, and Midwifery, held during the month of July, the following candidates were approved in the subjects indicated, but are not eligible for diplomas:—

Medicine.—F. N. Adams, St. Bart.'s; C. Adamson, Cambridge and Durham; B. Adlington, King's Coll.; A. J. Amor, Middlesex; T. F. Anderson, Univ. Coll.; Doris M. Baker, St. Mary's; H. C. J. Ball and W. A. Barnes, St. Bart.'s; R. M. Barron, St. Thomas's; R. H. Bestawros, Cairo; Anna M. V. Bonhote, King's Coll.; W. A. Bourne, H. F. Brewer, and D. A. Brigg, St. Bart.'s; G. C. W. Brown, Cambridge and St. Bart.'s; E. Buchler, St. Bart.'s; P. Chandler, London; W. T. R. Chapman and F. W. Charman, King's Coll.; K. R. Chaudhri and Gwendoline Chave, St. Mary's; Florence C. Churcher, Univ. Coll.; S. Cieman, Guy's; A. H. F. Cole, Durham; Doris M. Collins, Royal Free; W. R. F. Collis and J. W. E. Cory, King's Coll.; A. C. Counsell, Middlesex; A. A. Dalby, Guy's; A. F. C. Davey, Manchester; A. L. Davies, Oxford and St. Thomas's; D. J. Davies, Middlesex; Kathleen Davies, Charing Cross; C. S. Drawmer, St. Bart.'s; W. A. D. Drummond, Dundee; G. D. Drury, St. Bart.'s; J. D. Durance, St. Mary's; S. F. Durrans, Guy's; J. T. R. Edwards, St. Bart.'s; N. B. Farman, Charing Cross; C. F. Fernando, Univ. Coll.; Elsie C. I. Focke, Royal Free; Dorothea C. Forbes, Royal Free and St. Mary's; D. R. Grant and R. A. Grant, Guy's; J. F. Hamber and Hans-Raj, King's Coll.; C. L. Harding, St. Bart.'s; Iris M. Harmer, Univ. Coll.; S. J. Hoffman, Middlesex; D. B. Hughes, London; D. S. Huskisson, Guy's; H. N. James and Beatrice Jervis-White-Jervis, St. Mary's; Dilys Jones, Westminster; J. D. Jones, Liverpool; C. J. Jowett, Manchester; Caroline B. Kibble, Royal Free; G. F. Kinder, Liverpool; A. J. King, London; Nancy T. Lancaster, Univ. Coll.; H. Levy, St. Bart.'s; E I. Liberman, Guy's; W. E. Lishman, Liverpool; W. E. Lock, Middlesex; Madeline R. Lockwood, Univ. Coll.; Catherine B. McArthur, Royal Free; S. McClements, King's Coll.; F. G. Macdonald, St. Thomas's; Dorothy F. McIntosh, Charing Cross; H. Maclachlan, Guy's; J. H. Macpherson, King's Coll.; P. H. Martin, St. Bart.'s; Frances C. Nicklin, London; G. C. B. Oliver, St. Mary's; Evelyn D. Owen, Charing Cross; M. Y. Paget, Univ. Coll.; A. E. G. Parry, Birmingham; F. L. Patterson, London; C. E. Pearsons, St. Bart.'s; G. M. Pennant, King's Coll.; Audrey Phipps, Birmingham; Annie Pichaimuthu, Madras; H. C. Pierce, Cambridge and Liverpool; C. P. Pinckney, St. George's; B. Press, St. Bart.'s; J. Rafalowsky, Univ. Coll.; Olwen M. Richards, Charing Cross; G. D. Robb, Otago; J. T. C. Roberts, Liverpool; W. G. Roberts and W. F. Roper, Guy's; W. Richards, St. George's; Martha N. Russell, Royal Free; C. Sabhapati, Madras; C. M. Scott, Charing Cross; T. A. Seekings, Univ. Coll.; H. R. Shone, Liverpool; J. Shutt, London; Amelia M. Simmons, Charing Cross; Ethel L. A. Stamberg, Royal Free; R. Stanford, London; H. H. Steadman, Guy's; R. C. Tatham, Middlesex; J. D. S. Thomas, Guy's; R. W. Thomas, London; W. S. Thomas, Univ. Coll.; W. R. Thrower, St. Bart.'s; V. C. Tughan, K. H. Uttley, and J. H. M. Walker, Univ. Coll.; J. Wallman, London; R. A. Walsh, St. Bart.'s; H. V. Wells, Charing Cross; H. S. Welton, Liverpool; E. R. Williams, Cardiff; F. A. Wilson, Guy's; and Elizabeth E. Wintringham, St. Mary's.

Surgery.—C. H. Ackroyd, Leeds; G. L. Alexander, St. Bart.'s; G. T. Allerton, London; C. A. Amesur, St. Thomas's; S. M. Anderson, Middlesex; E. A. Aslett, St. Mary's; Alison E. M. Barnaby, Royal Free; S. A. Beards, London; L. F. Beccle, P. C. Bennison, and S. Berman, Guy's; R. V. Berrington, Liverpool; E. H. J. Berry, Guy's; O. P. Bewers, St. George's; H. E. Blake, Guy's; J. K. Bostock, Birmingham; P. G. Brain, London; S. Brest, St. Bart.'s; J. H. Broadhead, Guy's; T. H. P. Brooks, London; N. F. C. Burgess, Cambridge and Guy's; T. E. Cawthorne, King's Coll.; E. E. Claxton, St. Bart.'s; A. H. F. Cole, Durham; C. P. Craggs and B. W. Cross, St. Bart.'s; B. Crosthwaite, Durham; G. P. Crowden, Univ. Coll.; J. Cumming, Manchester; R. N. Curnow, St. Bart.'s; W. I. Daggett, King's Coll.; S. H. Dancel, Guy's; Gweneth M. Daniel, Westminster; D. J. Davies, Middlesex; E. W. P. Davies, Westminster; L. Davies, Guy's; G. H. Day, St. Bart.'s; F. M. Deighton, Univ. Coll.; G. W. S. de Jersey, Cambridge and St. Thomas's; D. S. Dixon, Middlesex; W. A. D. Drummond, St. Andrews; Josephine O. Ellen, Charing

Cross; Mary H. Elmitt, Royal Free; G. I. Evans, Manchester; J. P. Evans, St. Mary's; P. F. Evans, London; M. G. N. J. Everard, Sheffield; W. J. C. Fenton, London; M. G. Fitzgerald, St. Bart.'s; F. E. Fox, Cambridge and London; W. S. Fricker, King's Coll.; T. M. Fripp, Guy's; J. A. Galletly, Cambridge and Middlesex; J. Gaughan, Liverpool; N. T. Glynn, Cambridge and Liverpool; S. Goldstein, Westminster; G. D. Gordon, St. Thomas's; Minnie Gosden, London; F. G. Greenwood, St. Bart.'s; H. F. Griffiths, Cambridge and London; J. I. Griffiths, Univ. Coll.; R. F. Guymer, St. Thomas's; A. C. Hampson, Cambridge and Guy's; Constance E. Harrison, London; F. C. Hayward and W. E. Heath, St. Thomas's; O. L. Hutchinson, London; D. E. Iago-Jones and C. W. W. Jeremiah, Middlesex; L. Johnson, Liverpool; R. S. Johnson, St. Bart.'s; I. L. Johnstone, Middlesex; F. M. L. Jones, London; R. M. Jones, Guy's; W. E. Joseph, St. Thomas's; H. Joules, Middlesex; D. L. J. Kahawita, King's Coll.; L. A. Key, St. Thomas's; J. G. Kingsbury and F. H. K. Knight, Guy's; B. D. Knoblauch, Liverpool; R. L. Lancaster, London; G. S. Landon, Guy's; G. A. Q. Lennane, St. Thomas's; A. C. Liesching, St. Bart.'s; E. O. Lloyd, Middlesex; G. K. Loveday, St. Bart.'s; A. C. Lysaght, Guy's; W. J. McGuire, St. Mary's; G. R. Marcano and J. P. Marsden, St. Thomas's; F. Marsh, Guy's; F. Marty London; S. P. Meacock, Guy's; A. W. C. Mellor, St. Bart.'s; C. P. Miller, St. George's; J. G. Milner, St. Bart.'s; F. G. Mogg, Bristol; C. A. Mulligan, Manchester; J. V. O'Sullivan, London; W. B. Owen, Middlesex; T. B. Pahlajani, Charing Cross; V. Patrick, Manchester; J. E. Piercy, Guy's; F. D. S. Poole, St. Bart.'s; R. J. Pryddersch, Liverpool; L. N. Pyrah, Leeds; V. I. Raman, London; M. D. Rawkins, St. Bart.'s; A. B. Robinson, St. Thomas's; G. L. F. Rowell, St. Bart.'s; A. T. F. Rowley, Bristol; S. D. Schultz, Middlesex; H. Smith, St. Bart.'s; E. F. Stead, London; A. W. Summersgill, Manchester; G. W. R. Thomson, St. Thomas's; W. R. Thrower and H. Treissman, St. Bart.'s; J. M. van Schalkwijk, Guy's; J. H. M. Walker, Univ. Coll.; L. B. Ward, St. Bart.'s; B. G. Wheatley, Middlesex; F. L. White, London; H. K. Williams, Guy's; J. H. Williams, London; J. Wood, King's Coll.; H. M. Worth, Guy's; and H. C. Wykerd, London.

Midwifery.—M. Abse, Univ. Coll.; C. Adamson, Cambridge and Durham; G. N. M. Aitkens, Charing Cross; T. F. Anderson, Univ. Coll.; N. A. Arnold, Guy's; E. L. Auguste, Middlesex; Grace L. Austin, Univ. Coll.; Doris M. Baker, St. Mary's; L. J. Barford, Guy's; C. M. Barker, Univ. Coll.; S. Bartlett, Liverpool; D. E. Barton, St. Mary's; S. A. Beards, London; L. F. Beccle and P. R. T. Becker, Guy's; H. S. Bell, Liverpool; S. Berman, Guy's; T. W. Best, Univ. Coll.; Jane G. Bevan, Westminster; O. P. Bewers, St. George's; F. T. Birkinshaw, Univ. Coll.; W. R. Bonner-Morgan, St. Bart.'s; Susanna M. Bornman, Royal Free; J. K. Bostock, Birmingham; Edith D. Bowie, King's Coll.; D. D. Boxill, St. Mary's; Elsie Boyton, King's Coll.; S. Brest and D. J. Brims, St. Bart.'s; A. H. Brockbank, Guy's; G. C. W. Brown, Cambridge and St. Bart.'s; J. L. Brown, King's Coll.; Margaret H. Brown, Charing Cross; W. A. Browne, St. Mary's; H. Bruce, Leeds; Olive B. Buckley, King's Coll.; N. F. C. Burgess, Cambridge and Guy's; Isabella M. G. Butler, Univ. Coll.; Avie R. H. Cama, Royal Free; Margaret E. M. Carter, St. Mary's; Fanny L. Cattle, Univ. Coll.; W. E. Chiesman, St. Thomas's; J. E. Church, St. Bart.'s; Florence C. Churcher, Univ. Coll.; T. A. Clarke, Liverpool; E. E. Claxton, St. Bart.'s; D. R. T. Clendon, Univ. Coll.; Hilda A. Cohen, Charing Cross; H. A. Cole, Liverpool; Marian B. Coleman, Royal Free; G. Coope, Manchester; Jean Cooper, Royal Free; J. W. E. Cory, King's Coll.; A. S. Cox, Bristol; Dorothy E. Crellin, Bristol; B. R. Crossley, Univ. Coll.; J. Crowther, Manchester; P. C. Cumber and R. W. Cunningham, Guy's; J. Currie, St. Bart.'s; Evelyn J. Curtis, King's Coll.; Gweneth M. Daniel, Westminster; R. S. Davidson, Manchester; Annie E. C. Davies, Westminster; A. L. Davies, Oxford and St. Thomas's; G. Davies, Guy's; H. J. Davies, St. Mary's; Kathleen Davies, Charing Cross; L. Davies, Guy's; W. H. Davies, Westminster; G. Dignam, Manchester; H. E. M. E. Douglas, Liverpool; C. S. Drawmer, St. Bart.'s; H. Duff, Liverpool; D. F. Durward, Guy's; W. G. P. Dyson, Manchester; H. C. Edmunds, King's Coll.; R. W. Edwards, Guy's; Daisy M. Ellis, Edinburgh; A. J. Enzer, St. Bart's; I. Evans, St. Thomas's; J. Evans, Charing Cross; N. J. Everard, Sheffield; Christabel S. Eyre and Helen E. Fergusson, Charing Cross; C. F. Fernando, Univ. Coll.; H. E. Filmer, Guy's; J. W. Fisher, St. Mary's; A. H. W. Fleming, Manchester; Dorothea C. Forbes, Royal Free and St. Mary's; G. R. Ford, Guy's; Gladys M. Foxcroft, Royal Free; C. A. Francis, St. Bart.'s; C. L. Froehlich, Guy's; S. W. Gabbe, St. Thomas's; G. A. Garrett and J. Gaughan, Liverpool; Winefride M. Gibson, Charing Cross; G. D. Gillbard, Middlesex; N. T. Glynn, Cambridge and Liverpool; A. Gompertz, Durham; J. G. Goodman, Guy's; H. W. Gordon, St. George's; Minnie Gosden, London; J. Gray, Guy's; F. G. Greenwood, St. Bart.'s; H. F. Griffiths, Cambridge and London; H. L. Groom, Univ. Coll.; R. F. Guymer, St. Thomas's; G. Hamada, Birmingham; Iris M. Harmer, Univ. Coll.; Constance E. Harrison, London; W. D. Hasler, Middlesex; Irene D. F. C. Hastilow, Birmingham; Marjorie F. M. Hayward, London; Lynette Hemmant, King's Coll.; L. F. Henry, Liverpool; Freda K. Herbert, King's Coll.; Catherine M. Hext, London; H. F. Hiscocks, St. Bart.'s; F. Hoffstein, Charing Cross; F. H. Hollingshead, Bristol; H. B. Howell, St. Bart.'s; J. U. Human, Guy's; O. R. Humphreys, Cardiff; D. S. Huskisson, Guy's; D. J. C. Hutton, Middlesex; Adele H. Jacob, Royal Free; M. E. M. Jago, Guy's; Isabel E. S. James, King's Coll.; T. L. Jenkins, Middlesex; Beatrice Jervis-White-Jervis, St. Mary's; L. Johnson, Liverpool; Dilys Jones, Westminster; G. L. C. Jones, St. Bart.'s; I. H. Jones, Charing Cross; J. Jones, Cardiff; J. D. Jones, Liverpool; J. Joseph, Middlesex; Doris E. Keeves, Birmingham; J. J. Keevil, St. Thomas's; T. M. Kellough, Guy's; R. P. S. Kelman, Otago; Frances M. Kenyon, King's Coll.; H. Kesselson, Charing Cross; L. A. Key, St. Thomas's; A. J. King, London; C. T. Kitching, St. Thomas's; B. D. Knoblauch, Liverpool; S. N. Lahiri, Dundee; Marjorie A. M. Lambert, Royal Free; Nancy T. Lancaster, Univ. Coll.; R. L. Lancaster, London; S. W. Lane and Nora Leesmith, St. Mary's; G. A. Q. Lennane, Cambridge and St. Thomas's; H. M. O. Lester, St. Thomas's; S. Levy, Middlesex; A. C. Liesching, St. Bart.'s; Leonora M. K. Lines, Charing Cross; F. Lishman, Durham; T. J. Lloyd, Cardiff; Edna Lock and S. McClements, King's Coll.; F. G. Macdonald, St. Thomas's; Dorothy F. McIntosh and Kathleen G. B. McMahon, Charing Cross; Helen M. J. McQuaid, St. Mary's; R. G. Maliphant, Univ. Coll.; Eva M. Malmberg, King's Coll.; G. R. Marcano, St. Thomas's; D. P. Marks, Cambridge and St. Thomas's; J. P. Marsden, St. Thomas's; C. H. Mason, St. Mary's; S. Mellins, Middlesex; R. F. Middleton, Birmingham; F. C. Miller, Guy's; F. G. Mogg, Bristol; E. R. W. Mons-Glaser, Basle and Middlesex; S. K. Montgomery, Univ. Coll.; A. L. Moorby, King's Coll.; H. Moore, Guy's; G. J. Morris, Middlesex; T. W. Morris, Liverpool; R. H. Mortis, Charing Cross; E. F. Morton, Middlesex; I. S. Moscow, St. Bart.'s; A. M. Murray, Middlesex; K. V. Nair, London; Y. Nawar and Muriel I. H. Naylor, Birmingham; C. E. Nicholas and Frances C. Nicklin, London; Jessie G. A. Norman, Charing Cross; J. V. O'Sullivan, London; D. R. Owen, Cardiff; W. B. Owen, Middlesex; S. G. Pandit, Bombay; Dorothy M. Payton, Birmingham; C. E. Pearsons, St. Bart.'s; C. O. Perera, Ceylon; G. F. D. Perrott, St. Bart.'s; H. C. Pierce, Cambridge and Liverpool; C. P. Pinckney, St. George's; T. J. Pittard and B. Press, St. Bart.'s; L. W. Proger, Middlesex; D. C. Prowse, Bristol; Muriel A. Pugh, Charing Cross; P. E. Pym, St. Bart.'s; L. N. Pyrah, Leeds; J. Rafalowsky, Univ. Coll.; J. R. Ratcliffe, Guy's; M. D. Rawkins, St. Bart.'s; Marjorie D. Reddan, Royal Free; D. I. Rees, St. Thomas's; G. D. Robb, Otago and Middlesex; W. F. Roper, Guy's; A. W. L. Row, G. L. F. Rowell, and T. W. E. Royden, St. Bart.'s; Martha N. Russell, Royal Free; C. Sabhapati, Madras; K. G. Salmon, St. Bart.'s; K. G. W. Saunders, St. Thomas's; M. Schwartzman, Odessa and Middlesex; W. G. Sears, Guy's; R. Sellick, St. Thomas's; J. W. Shackle, Guy's; C. E. Sharp, Univ. Coll.; Catherine E. M. Siddall, Royal Free and St. Mary's; T. St. J. H. Silvester, Guy's; F. C Simpson, Manchester; Constance G. Sloan, St. Mary's; Frances E. Smith, Charing Cross; Sylvia M. T. Smith, Cardiff and Bristol; J. Stein, Univ. Coll.; J. A. F. Storrs, St. Bart.'s K. A. Soutar, St. Thomas's; L. P. Spero, St. Mary's; Elizabeth L. Taylor-Jones, Royal Free; D. E. Thomas, St. Bart.'s; J. G. T. Thomas, St. Mary's; R. W. Thomas, London; E. Thompson, St. Thomas's; H. Trafford, Guy's; H. Treissman, St. Bart.'s; E. A. Trim, St. Thomas's; K. A. Turner, Leeds; L. G. W. Urich, Middlesex; Dorothy I. Valentine, Liverpool; H. Van der Post and J. M. van Schalkwijk, Guy's; W. A. Vickers, Liverpool; J. Wallman, London; T. E. Walsh and A. G. Walter, St. Thomas's; R. L. Waterfield, Guy's; T. E. Watkins, Cardiff; W. N. Welinkar, Middlesex; Rosalind E. O. White, Charing Cross; I. E. Whitehill, Univ. Coll.; H. D. E. Whitman, Cardiff; R. A. K. Wiener, St. Thomas's; J. McM. Wilder, London; D. P. Williams and E. C. P. Williams, Middlesex; J. H. Williams, London; W. B. Williams, Charing Cross; D. A. Wilson, Middlesex; N. Wilson, Univ. Coll.; Ellen Wirtz, Royal Free; J. T. Woodhead, St. George's; C. L. Worthington, Guy's; and E. W. C. Woutersz, St. Mary's.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL. The Goldsmid Entrance Exhibitions for 1924 have been awarded to Mr. C. L. Owen, Trin. Coll., Cambridge; and Miss F. C. Kelly, Univ. Coll., London.

Bethlem Royal Hospital has been admitted as a school of the University of London in the faculty of medicine for the purpose of research in psychological medicine.

UNIVERSITY OF PARIS.—Post-graduate courses on dermatology and venereal diseases, commencing respectively on Oct. 3rd and Nov. 5th, 1924, will be held at the Clinique de Dermatologie et de Syphiligraphie of the Hôpital St. Louis, Paris, under the direction of Prof. Jeanselme. The fee for each course is Fr.150. A detailed programme and all further particulars may be obtained from Mr. Burnier, Chef du Clinique à la Faculté, Hôpital St. Louis (pavillon Bazin), 40, Rue Bichat, Paris (X^{ième}).

MIDDLESEX HOSPITAL MEDICAL SCHOOL, LONDON.—The introductory address at the opening of the winter session 1924–25, on Oct. 1st, will be delivered at 3 P.M. at the Queen's Hall by Dr. Charles Porter, on Some Aspects of Preventive Medicine, after which the prizes gained during the previous year will be distributed by the Earl of Birkenhead. In the evening, at 7.30, the annual dinner will be held at the Hotel Cecil, when Mr. G. Gordon-Taylor, M.S., F.R.C.S., will preside. Those wishing to be present at the dinner should communicate as soon as possible with the Secretary-Superintendent of the hospital.

ARTIFICIAL HELIOTHERAPY.—Recently the Hull Corporation authorised the maternity and child welfare committee to establish an experimental sunshine clinic for the administration of artificial heliotherapy to ailing and rickety children under 10 years of age.

Messrs. W. Heffer and Sons, Ltd., announce the early appearance of Practical Physical and Colloid Chemistry for Students of Biology and Medicine, by Prof. Leonor Michaelis, of Berlin, translated from the second German edition by T. R. Parsons, M.A., B.Sc., demonstrator in physiology in the University of Cambridge.

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THE LATE DR. R. A. WILLIAMS.—Dr. Robert Arthur Williams, who died recently at his residence at Porthcawl, was one of the oldest medical practitioners in South Wales and was well-known throughout Glamorgan. A native of Carnarvon, he was 74 years of age, and had been in general practice for nearly 43 years, 28 of which were spent at Ogmore Vale. He will be remembered by his many friends and patients, who had for him a great admiration as one of the rescue party in the Park Slip Colliery explosion, which occurred some 30 years ago and in which he nearly lost his life. Dr. Williams, who was one of the senior magistrates of the county, was a graduate of Edinburgh University, having qualified M.B., C.M. in 1882. He leaves a widow, one son, and two daughters.

DONATIONS AND BEQUESTS.—Under the will of the late Alderman G. Macpherson, of Wolverhampton, the testator left, among other bequests, £250 to the Royal Orthopædic and Spinal Hospital, Birmingham; £250 to the Royal Orphanage, Wolverhampton; £250 to the Wolverhampton and Midland Counties Eye Infirmary; and £250 to the Wolverhampton and Staffordshire General Hospital. Failing certain family trusts, he left £5000 to the Royal Orthopædic and Spinal Hospital, Birmingham; £5000 to the Royal Orphanage, Wolverhampton; £5000 to the Wolverhampton and Midland Counties Eye Infirmary; £5000 to the Wolverhampton and Staffordshire General Hospital; and the ultimate residue to the British Red Cross Society and/or such other societies, hospitals or institutions as may have been founded or established for the relief, cure, care, maintenance or support of wounded and disabled or blinded soldiers and sailors.—By the will of the late Mrs. Mary Frances Thorne, of Dunconusg, Lossiemouth, N.B., and of Heckfield, Hants, the testatrix left £1000 to the London Hospital, Whitechapel, for the maintenance of the "Maggie's Bed," and £1000 to the Royal Free Hospital, Gray's Inn-road, for the maintenance of the "Augustus Thorne" Bed.—The late Mrs. Louisa Walker, of Leytonstone, Essex, left by will £500 each to the London Hospital and the Poplar Hospital for Accidents.—By will the late Mrs. Camilla Anna Olympia Bertie-Roberts, of Chelsea left, among other bequests, £2000 equally between the Chelsea Hospital for Women, the Victoria Hospital for Children, the West End Hospital for Nervous Diseases, the Ophthalmic Hospital, the Normal School of Music for the Blind, and the Seamen's Hospital, Greenwich, and £100 to the Home for Disabled Soldiers and Sailors as well as £50 to the Home for the Dying, Mare-street, Hackney.—Among other bequests, the late Mr. G. M. Henton, of Leicester, left by will £1000 to the Leicester Infirmary.—The late Mrs. Emma Hinchliffe, of Upper Norwood, bequeathed by will £2000 to the Hospital for Sick Children, Great Ormond-street, in memory of her husband, Walter Hinchliffe; £1000 each to the Sunshine House Blind Babies' Home, Chorley Wood, the Westminster Hospital, the Cancer Hospital, Fulham-road, the Home for Incurables, Streatham, and the Home for Incurables, Putney; and (after personal bequests) all other her property "to the hospitals named above, especially those for children."

Medical Diary.

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LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, August 18th.—11 A.M., Surgical Registrar: Surgical Wards. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. Bishop Harman: Eye Dept.

FRIDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks Davis: Throat, Nose, and Ear Operations.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 18th, to SATURDAY, August 23rd.—THE HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton. Mon., 10 A.M., Dr. Burrell: Demonstration of Cases illustrating Protein Tests and Treatment of Asthma. 12 noon, Dr. Beaumont: Demonstration of Cases. 2 P.M., Dr. Melville: Demonstration in X Ray Department. Tues., 10.30 A.M., Dr. Punch: Demonstration of Morbid Anatomy. 11.30 A.M., Dr. Davidson: Demonstration of Cases. Wed., 10.30 A.M., Mr. Tudor Edwards: Operations. 2 P.M., Dr. Gosse: Demonstration in Wards. Thurs., 10 A.M., Dr. Burrell: Artificial Pneumothorax and Thoracoscopy. 12 noon, Dr. Beaumont: Demonstration of Cases. Fri., 10 A.M., Dr. Davidson: Demonstration of Cases. 11 A.M., Dr. Nelson: Artificial Pneumothorax. 2 P.M., Mr. J. E. H. Roberts: Operations. Sat., 11 A.M., Dr. Batty Shaw: Demonstration of Cases.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Mon., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 2 P.M., Mr. Nesfield: Conjunctivitis, Corneal Ulcer, Corneal Opacity. 4.30 P.M., Mr. Kenneth Lees: Demonstration on Mastoid Operation. Tues., 11 A.M., Mr. Kenneth Lees: A Practical Demonstration on Tonsillectomy. 2 P.M., Dr. King: Medical Cases. Wed., 10 A.M., Mr. Todd: Cases illustrating Orthopædic Principles. 2 P.M., Mr. Nesfield: Squint and its Treatment; Some Points in Refraction in Children; The Blindness of One Eye in Children. Thurs., 10 A.M., Dr. Winnicott: Medical Cases. 2 P.M., Mr. Whitchurch Howell: Demonstration of Surgical Cases, chiefly Orthopædic. Fri., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 3.30 P.M., Mr. N. C. Lake: Surgical Treatment of Hypertrophic Stenosis. Sat., 10 A.M., Mr. Whitchurch Howell: Operations.

Appointments.

ADAM, J., M.B., C.M. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Handsworth District of the county of York.

DORWARD, W. F., M.B., Ch.B. St. And., Superintendent of the St. Luke's Hospital at Haifa under the Jerusalem and the East Mission.

MERCER, L. D., M.B., Ch.M. Sydney, F.R.C.S. Edin., Honorary Assistant Surgeon for Diseases of the Ear, Nose, and Throat, Salford Royal Hospital.

PLATT, H., M.D., M.S., F.R.C.S. Eng., Consulting Orthopædic Surgeon to the Lancashire Education Committee.

SMITH, N. ROSS, F.R.C.S. Eng., Resident Medical Officer to the Freemasons Hospital and Nursing Home, Chelsea.

Vacancies.

For further information refer to the advertisement columns.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each £200.

Brighton, New Sussex Hospital.—H.S. £50.

Bristol General Hospital.—Two H.P.s, two H.S.'s, Res. Obstet. O., and Cas. H.S. Each £80.

Bristol Royal Infirmary.—Cas. H.S., Obstet. and Ophth. H.S. Each £100. H.P.'s and H.S.'s and Asst. Obstet. H.S. Each £80. Also Dental H.S. £116.

Bromley Borough.—Temp. Asst. M.O.H. £600.
Cairo School of Medicine.—Lecturer in Physics. L.E.540–840. Also Prof. of Physics, Prof. of Clin. Med., and Prof. of Clin. Surg. Each L.E.900–1140.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Half-time M.O. £200.
Colchester, Essex County Hospital.—H.S. £200.
Dundee Royal Infirmary.—Hon. Asst. P. for Dis. of Children.
Durham County Council Education Dept.—Asst. Oculist. £600.
East Ham County Borough.—Asst. M.O. £600.
Freetown, Sierra Leone, Sir Alfred Jones Research Laboratory.—Research Asst.
Gloucestershire Royal Infirmary, Gloucester.—Asst. P. and Pathologist.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—H.P. £100.
Kent Education Committee.—School Dentist. £504 14s.
Manchester Ear Hospital, Grosvenor-square.—H.S.
Melbourne University, Victoria, Australia.—Chair of Pathology. £1200.
Montana, Valais, Switzerland.—English Sanatorium. Asst. P.
Otago University, New Zealand.—Prof. of Surgery. £600.
Portsmouth Royal Hospital.—Third H.S. £150.
Preston, Lancs., County Mental Hospital, Whittingham.—Locum Tenens M.O. £8 8s. weekly.
Prison Medical Service.—M.O.'s. £350.
Royal Naval Medical Service.—Surgeon Lieuts. 25s. per day.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.
Southampton Free Eye Hospital.—Hon. Consulting S. and Hon. Dental S.
Staffordshire Education Committee.—Asst. Sch. Med. Insp. £600.
Sunderland Royal Infirmary and Children's Hospital.—Visiting M.O. £400.
Tunbridge Wells General Hospital.—H.S. £160.

The Chief Inspector of Factories announces the following vacant appointment: Market Deeping, Lincoln.

The Secretary of State for the Home Department gives notice of vacancies for Medical Referees under the Workmen's Compensation Act, 1906, for the Districts of the Dewsbury, Leeds, and Wakefield County Courts. Applications should reach the Private Secretary, Home Office, not later than August 30th.

Births, Marriages, and Deaths.

BIRTHS.

Halcomb.—On August 4th, at Doncaster, the wife of Dr. C. D. Halcomb, of a son.

Hume.—On August 7th, at Ellison-place, Newcastle-on-Tyne, the wife of Dr. W. E. Hume, of a daughter.

Philip.—On July 29th, at Greenleaf-road, Walthamstow, the wife of George S. Philip, M.B., B.S., of a daughter.

Wyatt.—On August 7th, at a nursing home in Birmingham, the wife of R. B. Hervey Wyatt, M.A., M.B., of a son.

MARRIAGES.

Lyle—Kime.—On July 26th, at Christ Church, Mayfair, Herbert Willoughby Lyle, M.D., F.R.C.S., F.K.C. Lond., to Grace, daughter of Mrs. Kime, of Fulbeck, Lincoln.

DEATHS.

Collins.—On August 6th, at Broseley, Shropshire, George Duppa Collins, M.R.C.S., L.S.A.

Cottell.—On August 7th, at a nursing home in London, Colonel Reginald James Cope Cottell, C.B.E., and Knight of Grace of the Order of St. John of Jerusalem, of Phillimore-terrace, Kensington.

Rosser.—On August 11th, at Glenalmond, Horley, Walter Rosser, M.D., late of Croydon, in his seventy-ninth year. Funeral at Parish Church, Reigate, Friday, at 3.30. No flowers.

Williams.—On August 7th, at Glenholm, West Walk, Leicester, Montagu W. Williams, M.R.C.S., L.R.C.P. Lond., L.S.A., aged 65 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
Inland	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
Abroad	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

SMALL ADVERTISEMENT RATES.

Books and Publications	Four Lines and under 6s. 0d.
Official and General Announcements	
Trade and Miscellaneous Advertisements	

Every additional line 1s. 6d.

For complete scale of advertisement charges apply to the Manager.

Notes, Comments, and Abstracts.

HEALTH SHRINES.

The idea that cures are inherent in certain localities is of hoar antiquity, and the pilgrimage which, we are informed, will start for Lourdes from Wimbledon next month is in a tradition dating from the beginning of the oldest civilisations known to us. The pilgrims will start encouraged by the belief that in 1922 two cases of Pott's disease and one of advanced tuberculosis were suddenly and radically cured at Lourdes. Such cures were necessarily "miraculous," for mere science or mere nature, though they may remove mountains on occasion, cannot suddenly arrest caries of the spine or restore the mischief done. A learned paper on the Cult of Asklepios and its rôle in the History of Medicine was read before the Third International Congress of the History of Medicine, by Dr. Alexander Cawadias, O.B.E., formerly chef de clinique of the Beaujon Hospital, Paris, and now senior physician and lecturer in clinical medicine at the Evangelismos Hospital, Athens. The paper has now been separately published as a pamphlet, in which Dr. A. Cawadias cites inscriptions discovered by his father, Dr. P. Cawadias, in the medical sanctuary at Epidaurus in 1881. "Some examples," writes Dr. Cawadias, "taken from the inscriptions discovered by my father in which are laid down the cures of Asklepios, will convince us that these cures were simple miracles such as are to-day the miracles of the Madonna of Lourdes or those of the Holy Virgin of Tenos in the Ægean." The inhabitants of the Ægean shores, when civilisation centred on those coasts, knew nothing of Pott's disease as a syndrome, but they believed that visits to particular shrines such as Epidaurus cured this and a number of other complicated conditions. "A woman is pregnant for five years," says the pamphlet, quoting the inscriptions. "After sleeping in the temple she awakes and is obliged to run rapidly out of the sanctuary because she felt that her pregnancy was coming to an end. She gave birth to a child which immediately after birth began to wash himself unaided, to walk and follow his mother." Again, a man with four fingers paralysed did not believe in the cures of Asklepios, but he consented to sleep in the Abaton, a building near the temple of Epidaurus specially dedicated to cures. While here he dreamt that he saw himself playing dice, and that the god rushed in and extended his fingers. A man, apparently blind of one eye, dreamt that he saw the god dropping something into the orbit. Both he and the man with a numbness of the fingers were thus miraculously cured. The dream and the vision of the god form part of the ritual of the cure in ancient times, just as among modern believers the cure has been preceded by an apparition either of a saint or a higher power. Among the Hindoos of the time of Père Dubois, for instance, a good-looking young priest invariably appeared in a dream in certain temples frequented by barren wives anxious to conceive and bear children. It would be unfair, however, to suggest that Lourdes and such shrines alone represent the survival of primitive faiths. The Continent, despite its rationalism, positively exudes belief in folk-medicine. No need for the French peasant—certainly in the Eastern provinces—to go to Lourdes to be cured of rheumatism in a vision. He can buy a cat-skin from among the pile in many a chemist's shop, and this will cure him if laid on the afflicted place, for it is still supposed to contain electricity. And, at any rate, as a grave person recently informed us, it keeps you warm. The established price of such a skin is 15 francs.

NEW MEDICAL EQUIPMENT IN THE UNITED STATES ARMY.

The Medical Corps of the U.S. Army has a Medical Field Service School, in association with which is the Medical Department Equipment Laboratory at Washington. Here was planned the U.S. first-aid packet (The Lancet, 1922, i., 960), and recently Major J. P. Fletcher, the Director, tells[1] us it has devised a battalion dispensary equipment to supply the needs of a battalion medical officer, particularly with regard to the requirements of the main dressing station. Experience having shown that 20 per cent. is the proportion of casualties to be expected, these have been averaged, and supply of dressings, &c., has been calculated thereon. The foundation of the equipment is four cases, measuring 31 in. by 19 in. by 15 in., marked M.D. 1, 2, or 3 (M.D. 1 is in duplicate). The cases have steel corners and are built up, not of three-ply wood merely, but of three-ply wood backed with steel, $\frac{1}{4}$ in. in all, a material which is thick, light, and strong, and easily got because used for trunk making in the United States. Each weighs

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[1] The Military Surgeon, June, 1924, p. 715.

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Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, August 18th, to SATURDAY, August 23rd.—THE HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton. Mon., 10 A.M., Dr. Burrell: Demonstration of Cases illustrating Protein Tests and Treatment of Asthma. 12 noon, Dr. Beaumont: Demonstration of Cases. 2 P.M., Dr. Melville: Demonstration in X Ray Department. Tues., 10.30 A.M., Dr. Punch: Demonstration of Morbid Anatomy. 11.30 A.M., Dr. Davidson: Demonstration of Cases. Wed., 10.30 A.M., Mr. Tudor Edwards: Operations. 2 P.M., Dr. Gosse: Demonstration in Wards. Thurs., 10 A.M., Dr. Burrell: Artificial Pneumothorax and Thoracoscopy. 12 noon, Dr. Beaumont: Demonstration of Cases. Fri., 10 A.M., Dr. Davidson: Demonstration of Cases. 11 A.M., Dr. Nelson: Artificial Pneumothorax. 2 P.M., Mr. J. E. H. Roberts: Operations. Sat., 11 A.M., Dr. Batty Shaw: Demonstration of Cases.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Mon., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 2 P.M., Mr. Nesfield: Conjunctivitis, Corneal Ulcer, Corneal Opacity. 4.30 P.M., Mr. Kenneth Lees: Demonstration on Mastoid Operation. Tues., 11 A.M., Mr. Kenneth Lees: A Practical Demonstration on Tonsillectomy. 2 P.M., Dr. King: Medical Cases. Wed., 10 A.M., Mr. Todd: Cases illustrating Orthopædic Principles. 2 P.M., Mr. Nesfield: Squint and its Treatment; Some Points in Refraction in Children; The Blindness of One Eye in Children. Thurs., 10 A.M., Dr. Winnicott: Medical Cases. 2 P.M., Mr. Whitchurch Howell: Demonstration of Surgical Cases, chiefly Orthopædic. Fri., 10 A.M., Mr. Broster: Cases illustrating General Surgery. 3.30 P.M., Mr. N. C. Lake: Surgical Treatment of Hypertrophic Stenosis. Sat., 10 A.M., Mr. Whitchurch Howell: Operations.

Appointments.

ADAM, J., M.B., C.M. Glasg., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Handsworth District of the county of York.

DORWARD, W. F., M.B., Ch.B. St. And., Superintendent of the St. Luke's Hospital at Haifa under the Jerusalem and the East Mission.

MERCER, L. D., M.B., Ch.M. Sydney, F.R.C.S. Edin., Honorary Assistant Surgeon for Diseases of the Ear, Nose, and Throat, Salford Royal Hospital.

PLATT, H., M.D., M.S., F.R.C.S. Eng., Consulting Orthopædic Surgeon to the Lancashire Education Committee.

SMITH, N. ROSS, F.R.C.S. Eng., Resident Medical Officer to the Freemasons Hospital and Nursing Home, Chelsea.

Vacancies.

For further information refer to the advertisement columns.

Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each £200.

Brighton, New Sussex Hospital.—H.S. £50.

Bristol General Hospital.—Two H.P.s, two H.S.'s, Res. Obstet. O., and Cas. H.S. Each £80.

Bristol Royal Infirmary.—Cas. H.S., Obstet. and Ophth. H.S. Each £100. H.P.'s and H.S.'s and Asst. Obstet. H.S. Each £80. Also Dental H.S. £116.

Oliver-Sharpey Lectures.

Delivered before the Royal College of Physicians of London

By A. V. HILL, Sc.D., F.R.S.,
PROFESSOR OF PHYSIOLOGY, UNIVERSITY COLLEGE, LONDON.

LECTURE II.*—THE RECOVERY PROCESS IN MAN.

Lactic Acid in Man.

It is a common observation that after exercise breathing is deep and rapid—that recovery is necessary. The same process must occur as in the isolated muscle, complicated in this case by the presence of the respiratory and circulatory mechanism. It can be shown that lactic acid occurs in human muscles as it occurs in isolated amphibian muscles. It had not been realised, however, till recently, how extensive are the changes connected with the lactic acid which is produced in the human body during exercise. When an athlete is running as fast as he can, about 3 g. of lactic acid per second are being liberated in his muscles! There are several signs of this lactic acid in the body. It occurs in the urine after prolonged hard exercise. In the blood of a resting man there is 0·01 to 0·02 per cent.; during and after severe exercise there may be as much as 0·20 per cent. This may be estimated directly by chemical analysis, or it may be inferred, as Barcroft did, from the change it produces in the oxygen dissociation curve. There is a very high respiratory quotient during, and especially just after, severe exercise; the lactic acid raises the hydrogen-ion concentration of tissues and blood; this stimulates the respiratory centre, with the result that CO_2 is eliminated by the lungs. In a later stage of recovery correspondingly the respiratory quotient falls to very low values as the lactic acid is removed. The chief sign, however, of the amount of lactic acid present in the body after exercise is the magnitude of the so-called oxygen debt. A muscle which has been active requires oxygen to carry out the combustions needed to provide the energy for the restoration process. The oxygen used in recovery is a measure of the magnitude of that process—that is, of the amount of lactic acid removed. Assuming an efficiency of recovery of 5·2 : 1, one litre of oxygen consumed after exercise is equivalent to 7 g. of lactic acid removed. The greatest oxygen debt hitherto recorded is one of nearly 19 litres, which corresponds to a concentration of lactic acid of not far from 0·35 per cent. in all the muscles of the subject; he was well-nigh exhausted.

Studies of Oxygen Intake.

The greater part of our knowledge of the events occurring in human muscular exercise has been arrived at by studies of the oxygen consumption. The measurement of oxygen intake is possible in many ways, two of which have been widely used in recent years. The first, which was employed by Benedict and Cathcart among others, involves the continuous circulation of oxygen in a closed system which includes the lungs of the subject, the CO_2 being absorbed and the diminution in volume owing to consumption of O_2 being recorded. The method is accurate but inadaptable; it is not capable of analysing the time course of the oxygen consumption when the latter is changing rapidly, as at the beginning and end of exercise. For such purposes the technique of the Douglas bag, in which the subject expires into a large bag carried on his back or in front of him, and the expired gases are analysed and their volume measured, is just as accurate as the other method and is capable of following very rapid changes. It is possible to use this method when walking, running, riding a bicycle, even swimming, and to plot the time course of the oxygen consumption in intervals as short as half a minute. Under certain circumstances even quarter minute intervals may be employed.

The "Steady State."

In my previous lecture I spoke about the steady state of an isolated muscle contracting in an atmosphere of oxygen; in such a muscle there is a balance between breakdown and recovery. Remember that the recovery process is more rapid when the total amount of breakdown causing it is greater; lactic acid is a sensitive governor of oxygen usage. Hence, if we start with a given rate of breakdown, as when a man suddenly begins to run at a given speed, the rate of recovery, starting from zero, has to work up gradually until it balances the rate of breakdown. It is necessary, moreover, in the intact animal for the circulation and respiration to work up also. In a subject starting to run, having been previously at rest, the oxygen intake rises to its full steady value in a period of about two to two and a half minutes (see Fig. 3). If the running be continued at a constant speed the oxygen intake also remains constant thereafter—or almost constant—till the end of the exercise (Fig. 3, Curve I.); the subject is in what we may call a "steady state." This state corresponds to a constant concentration of lactic acid in the muscles, constant owing to a balance between formation and removal. As the exercise, however, is continued, the lactic acid present in the active muscles gradually passes, by diffusion, into the blood and thence to other parts of the body. This is probably one explanation of the fatigue resulting from long-continued, moderate exercise, a matter now being more fully studied by Lupton and Long. The oxidative removal of the lactic acid formed in one muscle may in this manner occur in other distant muscles by its passage, via the blood, from the one to the other. As Barr in New York has found, the venous blood from a resting muscle, during the vigorous activity of others, may contain *less* lactic acid than the arterial blood coming to it. Indeed, in this sense it is possible to recover in one's arms from exercise taken in one's legs! This may be an important factor in recovery from vigorous exercise taken by small portions of the muscular system; it cannot have much effect in severe general exercise.

It is to be noted that an apparent "steady state" may occur, during muscular exercise, in which the oxygen intake is constant, which is not, however, really "steady" at all; there is a continual onset of fatigue. The oxygen intake may attain its maximum (Fig. 3, Curve II.) and remain constant merely because it cannot go any higher (e.g., to Curve III.) owing to the limitations of the circulatory and respiratory system. Such a condition causes an accumulation of lactic acid in the muscle and can end only in complete exhaustion.

Recovery.

When the exercise terminates the lactic acid in the muscles must be removed and oxygen must be taken in to provide the necessary energy. The lag in the oxygen intake at the beginning of exercise, during which the lactic acid was concentrating, must be compensated by an extra intake afterwards when it is diminishing again. After a short bout of moderate exercise (Curve I.) the oxygen intake falls in a period of five to ten minutes to its resting value. After severe or prolonged exercise (Curve III.) it may be an hour before the oxygen intake is normal again. The total amount of oxygen used in the recovery process may be measured by collecting the whole of the expired gases over any desired interval, by an estimation of the total oxygen used in that interval, and subtraction of the amount of oxygen which the subject would have used had he remained throughout at rest.

"Oxygen Requirement."

It is desirable here to introduce a new term—namely, the "oxygen requirement" of exercise. If the exercise be very mild (Fig. 4), then the oxygen requirement may be met by the actual oxygen

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[1] Lecture I. appeared in The Lancet of August 16th.

39 lb. The two M.D. 1 cases carry dressings; they stand on their ends and open like a wardrobe. In the lid is a flap-table which rises when the lid is opened to a right angle, and articulates with the rest of the chest to form a table for instruments, &c., and there is a fitting to hold the handles of a stretcher on the side of the chest. The chests M.D. 2 and 3 are mére shells, their contents being carried in trays, so planned that they can be taken out and built up into something like a dinner wagon, when all their stores are available without further unpacking. The whole equipment has been very carefully thought out. M.D. 2 is "the drug trunk," and M.D. 3 "the kitchen trunk," with a flashlight, a gasoline stove, a six-quart kettle, tea, coffee, and milk to provide the wounded with hot drinks; even cigarettes are not forgotten. In addition, there is a "lantern crate," with paraffin, three hurricane lamps, and three spare glasses. Also there is a small tent with pole sections to shelter one or two stretcher cases under operation. A bag of splints, a bag for sterilising water, 12 stretchers, 36 blankets, shovel, pick, &c., complete this large supply. We would point out, however, that Major Fletcher's paper must be read in the original, for without the illustrations it is impossible to appreciate the ingenuity of the apparatus. Further, we commend a system which allows the officer chiefly responsible for a novel equipment, as this is, to explain it to the Service before issue, thus winning for it in advance interest and perhaps approval, and side-tracking ill-informed criticism.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of The Lancet.

Sir,—Will you allow us to make a very urgent appeal for funds to send working girls and women away for a short holiday? Many of those who are hoping to go during the next few weeks have never slept out of London for a single night. They have been saving up for months to get this unique privilege, and are even now counting the days in hot workshops and dusty factories, till they can have if only one week of freedom and fresh air. The large amount of unemployment which still continues among men has made the women and girls in many cases the sole support of their families. It is obvious that these cannot pay much towards their holidays; obvious, too, that young people living in narrow streets and overcrowded rooms may be permanently injured in health if no change is possible.

In weather such as this, who can happily arrange or take a holiday without doing something to enable those less fortunate to have—for even one week—the good food and rest and refreshment that may set them up for the long months of the winter's work?

Subscriptions and donations will be thankfully received by the Chairman of the Executive Committee, Mr. J. F. Green, or Miss Canney, 75, Lamb's Conduit-street, W.C. 1.

Yours faithfully,
(Signed) Alberta Sandwich, Mary St. Helier, J.P., L.C.C.
A. F. London, J. A. Hertz, Chief Rabbi.
Mary Scharlieb, Robert F. Horton,
Louise Creighton, Frank Lloyd.

August 11th, 1924.

MEDICAL ATTENDANCE IN STREET ACCIDENTS.

The Bolton watch committee has received a letter from the branch secretary of the British Medical Association, Lancashire and Cheshire Branch, stating that the branch had been requested by the Chief Constable of Lancashire to lay down a scale of fees for attendance on cases of accidents or sudden illness in the street when a medical man is summoned, and that the following fees were accepted by the Chief Constable of Lancashire as being suitable—viz., between 8 A.M. and 8 P.M., 7*s.* 6*d.* per visit; between 9 P.M. and 8 A.M., 15*s.* per visit, with mileage of 1*s.* per mile beyond one mile from the residence or surgery of the doctor called on by the police to give medical and surgical aid; and asking this committee to adopt a similar scale of fees. The Chief Constable recommended that the scale should be adopted and the committee agreed.

AN AID IN DEFÆCATION.

The ordinary closet seat does not permit the squatting position to be used in the act of defæcation, though there are many sound reasons why this position, which is naturally assumed by primitive peoples and children, is to be commended. For the last 20 years improved closet seats have been exhibited at medical gatherings, see, for instance, The Lancet, 1905, ii., 167. We have now received from the Proper Adjustable Foot Rest Company, 36, Northgate, Newark-on-Trent, Notts, a description of an adjustable foot-rest the use of which ensures the correct squatting position on the w.c. seat. It can be used with any w.c. pan, is adjustable for tall or short people, and is readily affixed to wood, tile, or concrete flooring. The price is 45*s.*

GRATUITOUS MEDICAL ATTENDANCE.

To the Editor of The Lancet.

Sir,—Among the unwritten laws of medical ethics there appears to be fluctuations, yet, I suppose, there are certain fixed or semi-fixed ideas which are held more or less in common.

I am writing to ascertain the general view of the medical profession with regard to non-medical persons from whom fees should not be accepted. Naturally "hawks dinna pyke oot hawks e'en," and the doctor goes scot-free. His wife also is exempt. On these points I have no doubt all are in agreement. What I should like to know is how far the list extends. I venture to schedule the following:—Doctors' widows; doctors' children, while dependent; nurses and medical students.

In old days I believe clergymen were placed on the free list, and qualified dentists also. Probably this is still general. Would one now include those whose activities are placed at the profession's disposal—e.g., chemists?

I think the point may not be without interest because practice in these matters does not appear to be uniform.

I am, Sir, yours faithfully,
August 9th, 1924. Inquirer.

*** As the medical profession has become more subdivided, and as the groups directly ancillary to medicine have become more numerous, applicability of general rules has been found in practice impossible. No doctor charges a doctor, but even here there may be exceptions by mutual agreement, the reasons for which will occur to everyone. Again, if the widow of a doctor can pay easily for medical attendance, she does not, as a rule, demand gratuitous services from medical men who are strangers; while no practitioner, previously in relations with her husband, allows her to pay except as the result of conversation on the subject. With regard to medical students, their care naturally devolves without payment of fees on those who have charge of their studies, though it is easy to see that here particular circumstances might dictate quite naturally the offer and the acceptance of fees. Nurses always obtain medical advice and treatment from those with whom they work professionally. But the qualified dentist is in rather a different case and is usually dealt with in accordance with particular circumstances; no general law can possibly meet those circumstances, but mutual arrangements that are fair and that preserve professional cordiality can usually be arrived at. The custom of attendance upon the clergy has for many years followed the individual inclination of practitioners, but the sympathy of the medical profession for their ill-paid clerical colleagues has always been practically manifested, and is so to-day.—Ed. L.

URGENT TELEPHONE CALLS.

To the Editor of The Lancet.

Sir,—In The Lancet of August 9th you quote from Dr. Waldo's remarks concerning the ignorance of the public about all matters connected with fires, especially his observation that: "Not uncommonly, again, on the breaking out of a fire, persons on using the 'phone merely say—Fire! and, without waiting to give their address, replace the receiver and await the arrival of the fire brigade, which, of course, never comes." But I would point out the instruction in the London Telephone Directory is ambiguous in this respect, as will be seen by the extract which follows:

> Emergency Services. (Fire, Ambulance, Police.)
>
> If in case of emergency the Fire, Ambulance, or Police service is required, all that is necessary is to answer the telephonist's query "Number, please?" with the word, "Fire," "Ambulance," or "Police," as the case may be. *Do not give number.* (See instructional headlines.)

I suppose this means: "Do not stop to give the number of any fire station, but give your own name and address and number"; but it could be read: "Do not give any number at all."

I am, Sir, yours faithfully,
F. W. W.

*** In a letter just issued to the press by the Chairman of the Metropolitan Boroughs' Traffic Subcommittee, it is stated that in case of accident the telephone exchange should be asked for "ambulance"; no number is required and no charge is made for the call, whether it is made from a public call office or from a private telephone. As soon as the caller gets through to the headquarters of the Ambulance Service, *particulars as to the locality of the accident or illness should be made together with the name of the caller.* To enable premises upon which a telephone is available to be readily identified, the London County Council have prepared indicating tablets containing the letter "A" which will be placed outside premises, from which, by the courtesy of the occupants, an ambulance may be summoned. Telephone subscribers who are willing to assist in this direction are asked to send their telephone numbers and addresses to the Officer in Charge of the Service, 94, Southwark Bridge-road, S.E. 1.—Ed. L.

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LECTURE II.*—THE RECOVERY PROCESS IN MAN.

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STUDIES OF OXYGEN INTAKE.

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THE "STEADY STATE."

In my previous lecture I spoke about the steady state of an isolated muscle contracting in an atmosphere of oxygen; in such a muscle there is a balance between breakdown and recovery. Remember that the recovery process is more rapid when the total amount of breakdown causing it is greater; lactic acid is a sensitive governor of oxygen usage. Hence, if we start with a given rate of breakdown, as when a man suddenly begins to run at a given speed, the rate of recovery, starting from zero, has to work up gradually until it balances the rate of breakdown. It is necessary, moreover, in the intact animal for the circulation and respiration to work up also. In a subject starting to run, having been previously at rest, the oxygen intake rises to its full steady value in a period of about two to two and a half minutes (see Fig. 3). If the running be continued at a constant speed the oxygen intake also remains constant thereafter—or almost constant—till the end of the exercise (Fig. 3, Curve I.); the subject is in what we may call a "steady state." This state corresponds to a constant concentration of lactic acid in the muscles, constant owing to a balance between formation and removal. As the exercise, however, is continued, the lactic acid present in the active muscles gradually passes, by diffusion, into the blood and thence to other parts of the body. This is probably one explanation of the fatigue resulting from long-continued, moderate exercise, a matter now being more fully studied by Lupton and Long. The oxidative removal of the lactic acid formed in one muscle may in this manner occur in other distant muscles by its passage, via the blood, from the one to the other. As Barr in New York has found, the venous blood from a resting muscle, during the vigorous activity of others, may contain *less* lactic acid than the arterial blood coming to it. Indeed, in this sense it is possible to recover in one's arms from exercise taken in one's legs! This may be an important factor in recovery from vigorous exercise taken by small portions of the muscular system; it cannot have much effect in severe general exercise.

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RECOVERY.

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"OXYGEN REQUIREMENT."

It is desirable here to introduce a new term—namely, the "oxygen requirement" of exercise. If the exercise be very mild (Fig. 4), then the oxygen requirement may be met by the actual oxygen

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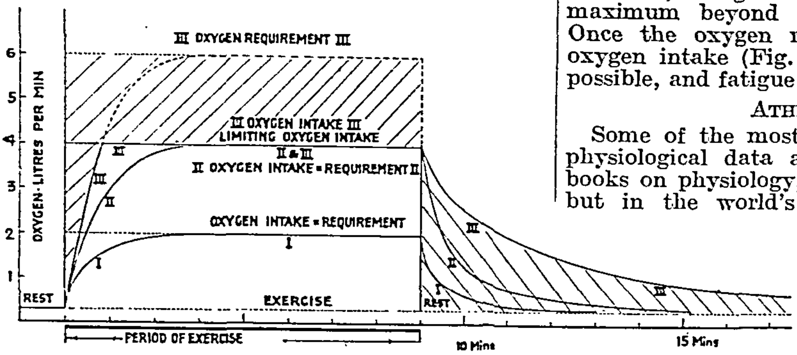
[1] Lecture I. appeared in THE LANCET of August 16th.

intake once the steady state has been attained. If, however, the exercise be severe the oxygen requirement cannot be met, even when the heart and lungs have attained their maximum activity; if the exercise be persisted in, the body necessarily incurs what we may call an oxygen debt. *Were it* not for the fact that the body is able to obtain its energy in this way, by using its necessary oxygen afterwards, severe exercise would be impossible in man. We should never be able to run upstairs, or to run on the flat at more than eight or nine miles an hour. We can do so only because Nature has provided us with an arrangement, like an accumulator which can be run down at a very high rate, as in starting a car, and then must be recharged slowly afterwards.

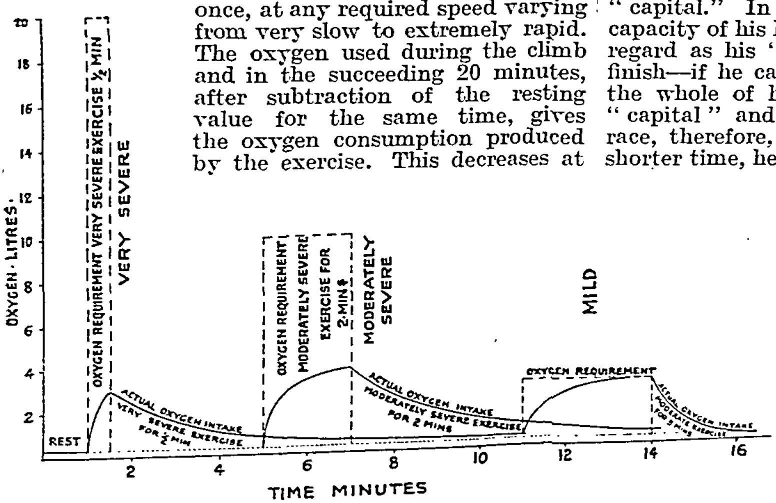
FIG. 3.



The oxygen requirement of a given type of exercise, or of a given isolated movement or series of movements, can always be measured. The oxygen requirement may be much higher than any possible oxygen intake. If, however, the movement be carried out only for a short time, and the total oxygen used *during it, and in recovery from it*, be measured, then the total oxygen so found is the requirement of that piece of exercise. In this way it is possible to study the energy requirement of even the most violent and discontinuous movements. To take an example, Lupton has measured the maximum efficiency of the process of climbing a staircase; not for the intrinsic interest of that process, but in an endeavour to show that there exists, for many muscular movements, a certain optimum rate. The subject ascends the staircase once, at any required speed varying from very slow to extremely rapid. The oxygen used during the climb and in the succeeding 20 minutes, after subtraction of the resting value for the same time, gives the oxygen consumption produced by the exercise. This decreases at first as the speed is increased, and then increases again, showing that there is indeed an optimum speed.

This existence of an optimum speed does not occur in all types of exercise. In running the oxygen *requirement* increases continuously as the speed increases, though the actual oxygen *intake* reaches a maximum beyond which no effort can drive it. Once the oxygen requirement is larger than the oxygen intake (Fig. 3), a steady state is no longer possible, and fatigue ensues more or less rapidly.

FIG. 4.



Example of "oxygen requirement." Rest 200 c.cm./min.; ½ min. exercise; total oxygen during exercise and in subsequent 14½ min. (recovery assumed complete) = 10 litres. Oxygen consumption due to the exercise 10 − 15 × 0·2 = 7 litres = 14 litres per min. requirement.

Example of "oxygen debt." Rest 250 c.cm./min.; exercise; total oxygen in 32 min. following exercise = 18 litres; subtract resting consumption 32 min. = 0·25 × 32 = 8 litres. "Oxygen debt" = 18 − 8 = 10 litres.

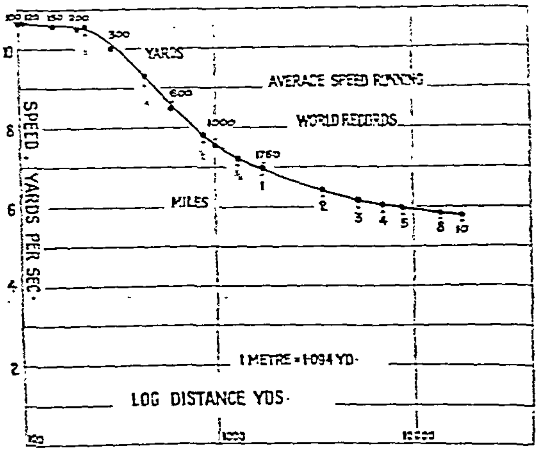
ATHLETIC RECORDS.

Some of the most accurate, the most consistent, physiological data available are contained, not in books on physiology, not even in books on medicine, but in the world's records for running different horizontal distances. If one plots the average speed at which the record was made, against the length of the race (compressed in some manner—as by taking its logarithm—to bring all the points on to the same diagram), then a curve (Fig. 5) of almost perfect smoothness is *obtained, in which a few points only lie just below* the curve. These latter are for the races in which athletes have not been so concerned to break the record as in the rest. The relation shown in the curve may be accepted practically as a natural constant for the human race; it would require almost a superhuman effort to change one of the points by 2 per cent.; and it is interesting to consider what determines the shape of this relation. At very short distances the speed is constant; it is the maximum which a man can attain, though it falls off a little as the accumulation of lactic acid in the muscles affects their speed of relaxation. At very long distances the speed again tends to become constant, practically a steady state to be attained. It is determined by the maximum amount of oxygen which the athlete can take in, to provide his muscles with their necessary energy, and the economy with which he uses it. Speed at intermediate distances is determined, partly by the maximum oxygen debt which the body can incur, partly by its maximum oxygen intake. We assume, of course, that we are dealing with a man in perfect condition, highly trained to carry out his movements in the most economical manner possible, ready and willing in a race to exhaust himself completely. In the magnitude of the oxygen debt, that is in the concentration of lactic acid which his muscles can tolerate, we have what we may regard as a man's "capital." In his oxygen intake, determined by the capacity of his heart and lungs, we have what we may regard as his "income." In a race an athlete will finish—if he can, if the race be not too short—with the whole of his reserves gone, having spent both "capital" and "income" completely. In a short race, therefore, he can spread his "capital" over a shorter time, he can expend energy more rapidly than he can in a long one; the form of the curve is determined mainly by these factors.

"OXYGEN DEBT."

Recently we have made a number of estimations of "oxygen debt." The most striking are those (*a*) in which 23 seconds of exercise led to a debt of 8·7 litres, (*b*) running for 33 minutes at a medium speed only of 7·9 litres, and (*c*) "standing running" with extreme violence for 4 minutes of 18·7 litres. The larger values mean enormous amounts of lactic acid accumulated in the body; how can this acid be tolerated? Inside the muscle are three alkalies capable of neutralising the acid, and the hydrogen-ion concentration in the active muscle does not rise very far so long as the amount of these alkalies is adequate. It would seem probable that the limit to which it is possible to press a muscle is determined by the amount of alkali within it capable of neutralising the acid product of its activity.

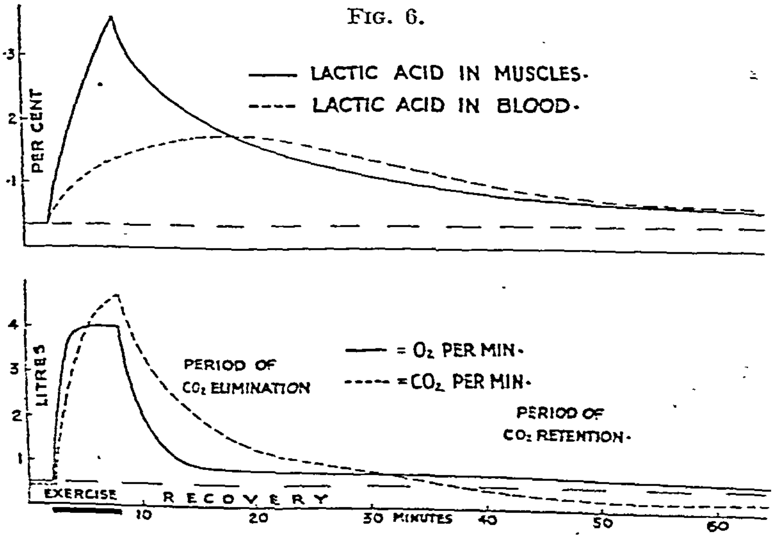
FIG. 5.



CO₂ ELIMINATION AND RETENTION.

This sudden production of acid, as pointed out above, is the explanation of the large amounts of CO_2 that come off during the exercise (Fig. 6, lower half). When the lactic acid is removed in recovery, the same quantity of CO_2 must be retained as was originally eliminated; sodium lactate must become sodium bicarbonate again. Consequently, we find very low respiratory quotients in the later stages of recovery. The CO_2 retained is a measure of the lactic acid got rid of. The oxygen used in recovery is a measure of the carbohydrate (or lactic acid) oxidised. The comparison of the two enables us to determine in man the "efficiency" of recovery. Again, we find that at most a small fraction of the lactic acid has been oxidised, the value determined for the "efficiency" of recovery is almost identical with that found in the case of isolated frog's muscle; a sufficient reward for the faith that Nature is consistent.

FIG. 6.



Direct Measurement of Lactic Acid.

During and after exercise lactic acid occurs in the blood; during the steady state of continued exercise this lactic acid accumulates to a constant concentration characteristic of the violence of the exercise. In my last lecture I showed that the speed of the recovery process depends upon the magnitude of the breakdown from which recovery is necessary. The rate of recovery, given an adequate supply of oxygen, is proportional roughly to the square of the concentration of lactic acid in the active muscle. The lactic acid is a sensitive governor of oxidation. If we regard the resting oxygen consumption of man as being due to recovery from very small amounts of exercise, slight bodily movements, movements of heart and lungs, muscular tone, then for four times the oxygen consumption, such as occurs in a steady state of ordinary walking, we should expect not four times the lactic acid concentration in the blood, but only twice; for 16 times the oxygen consumption—the limit approached during hard exercise—we should expect not 16 times, but four times the lactic acid concentration in the blood. Recent experiments by Long, still only preliminary, tend to some degree to confirm this expectation. It will be a very fortunate thing for the body if, when we take 16 times as much exercise, the lactic acid concentration in our blood only rises four times; it would have been very awkward had it been the other way round! It would seem almost a provision of Nature, an adaptation to a requirement, only that it is difficult to conceive how even evolution could have evaded the laws governing bi-molecular reactions. Perhaps it merely took advantage of one which happened to be available. *The fact, in any case, is an* interesting example of the application to man of one of the by-products of experiments first performed on frogs.

The lactic acid, however, is more interesting when we are not dealing with the steady state. After very severe exercise the lactic acid in the muscles cannot fall very rapidly owing to the inadequacy of the oxygen supply. *It diffuses out, therefore, into the blood and* all round the body. It reaches its maximum in the blood some ten minutes after it has attained its maximum in the muscles (Fig. 6, upper half). Hence the maximum in the blood is lower than in the muscles. At the particular moment, however, when it is at its maximum in the blood, we may be sure that it is the same in the muscles; equally it is certain to be the same in both at the end of recovery, when both are becoming constant. It is possible, therefore, by a direct analysis of lactic acid in the blood to ascertain the concentration in the muscles at two moments: (1) about ten minutes after exercise, and (2) towards the end of recovery. By such direct analyses it is possible to determine directly—if somewhat roughly—the amount of lactic acid which has disappeared in the recovery process. This may be compared, as in the case of the lactic acid calculated from the CO_2 retention, with the oxygen used in that removal, and it is found, as in the frog's isolated muscle, that the acid is not oxidised; only about one-sixth of the oxygen is used which would be required were all the lactic acid broken down to CO_2 and water. The same ratio for the "efficiency" of recovery is attained in man as in the isolated muscle.

FACTORS AFFECTING SPEED OF RECOVERY.

The speed of the recovery process depends in a healthy man on the oxygen supplied to the active muscles. This is limited by two factors: first, the total oxygen that can be taken through the lungs into the blood and circulated by the heart; second, the local circulation to the part involved. Many observations have been made of the oxygen intake of a man undergoing various forms of severe muscular exercise. The highest value recorded while breathing air is 4·2 litres per minute; breathing 50 per cent. oxygen, very nearly six litres has been reached. The only possible reason why more oxygen can be taken in, when breathing oxygen, is that the blood is not completely saturated during very severe exercise when breathing air; the greater saturation, however, of the coronary blood, when breathing oxygen, may then result in greater cardiac activity. The magnitude of the oxygen intake is determined mainly by the capacity of the heart, and I give later a calculation showing what this number means in heart output. The other factor determining the speed of the recovery process is the local supply of blood to the muscles actually involved in the work. Lindhard showed that in such exercise as holding the body with arms bent, on rings in a gymnasium, the blood-supply to the active muscles of the arm is almost completely cut off. The whole of the oxygen required had to be used after the exertion was over. In running the supply of blood to the active muscles is particularly easy, as they are never rigid and their movements are rapid. In rowing the supply of blood to the muscles must be much more difficult; the muscles are rigid for longer periods, and their movements are relatively slow; they exert less pumping action on the veins; consequently rowing places a greater strain on the heart.

Heart Output from Oxygen Intake.

The values of the oxygen intake during severe exercise allow a striking—if approximate—calculation of the output of the heart. Assuming, as was the case in the subject who consumed 5·9 litres of oxygen per minute, an oxygen capacity of 21 c.cm. per 100 c.cm. of blood, and an average utilisation coefficient of 75 per cent. (a value as high as has ever been recorded), then the actual oxygen taken in must have required 37·5 litres of blood per minute to carry it. This amount of blood has been ejected from the heart twice, from the right side once, and from the left side once; altogether, therefore, 75 litres of blood—about 17 gallons, about 120 times the heart's own volume—have been pumped out in every minute. Even assuming a utilisation coefficient of 100 per cent., 56 litres (12½ gallons) of blood must have been pumped together from the two sides of the heart. Compare these volumes with the amount of water which a bath tap can pour out in a minute, even when turned full on! In such exercise the heart-rate—recorded with a string-galvanometer—is about 180, which means that each side of the heart ejects some 200 c.cm. per beat. There is no possible flaw in the argument or calculation, otherwise it would be difficult to believe the conclusion. It is little wonder that the heart sometimes cannot stand the strain.

Energy Requirement of Heart.

It is possible, by an approximate calculation, to determine the oxygen consumption of the heart during such exercise. The calculated output of blood, multiplied by the blood pressure, gives us the work done; assuming an efficiency of 20 per cent., which is a high value under such conditions, the total energy used by the heart can be calculated. The provision of this energy requires the consumption of oxygen, and it would appear that the oxygen requirement of the heart during such exercise as that described above is about 300 c.cm. per minute—about half its own volume. Assuming a utilisation coefficient of 75 per cent. and an oxygen capacity as before, this requires two litres of blood to pass through the coronary vessels of the heart per minute. This volume of oxygen, actually used by the heart, is equal to that *required but never obtained* by voluntary muscle during the most violent exercise. The muscle has to stop within a minute, owing to oxygen-want; the heart, however, owing to its better oxygen-supply, when the coronary circulation is efficient, is able to keep up an output of this order for long periods.

Other Factors in Recovery.

The recovery process depends also on other factors. In my last lecture I showed how in the isolated muscle it depends on the hydrogen-ion concentration. Deep breathing, therefore, sweeping away the CO_2 and keeping the body alkaline, may be essential to the quickness of the recovery process. It must depend also upon the presence of oxidative catalysts. Recent work by Hopkins has shown the presence in tissues of a di-sulphide compound, glutathione, which acts practically as an oxidative catalyst. The discovery of similar substances has been made independently by Meyerhof. I need not discuss the mechanism of glutathione now, otherwise than to say that in its di-sulphide form it seems to act as a hydrogen acceptor and so to liberate oxygen for the oxidation of something else, and then itself to be oxidised, by molecular oxygen or otherwise, to its original di-sulphide form.

$$-S-S- + H_2O \longrightarrow -S-H + H-S- + O$$
$$-S-H + H-S- + \tfrac{1}{2}O_2 \longrightarrow -S-S- + H_2O.$$

Recent experiments by Hartree have suggested that an isolated muscle left in Ringer's solution has its speed of recovery diminished; this may be a time effect, but it is possibly due to the washing away of oxidative catalysts from the muscle by the Ringer's solution surrounding it. Clearly the experiment must be tried on muscles carefully perfused before use. It is likely, in any case, that the oxidising faculty of tissues will vary from individual to individual. It may be, therefore, that important divergencies from the normal will be found in persons suffering from various forms of dyspnœa, in respect of their oxidative metabolic power. Possibly athletes, and people accustomed to heavy work, will develop this side of their metabolic activities. Recent work by Miss Robinson in Hopkins's laboratory has shown that hæmoglobin has a very distinct catalysing power in the oxidation of unsaturated fats. The dyspnœa so often associated with anæmia may in some cases be due to the absence not only of an adequate oxygen-supply, but of an adequate amount of some oxidising catalyst. Recent work by Warburg and his colleagues has shown that many forms of biological oxidation probably occur as surface phenomena, catalysed by iron atoms embedded in the surface; the absence of the iron, or its removal from activity by physical or chemical means, will hinder or prevent oxidation, as also will displacement of the oxidisable bodies, by narcotics or other substances, from the active surfaces where oxidation goes on. Imperfect metabolism of iron, excretion of it, its combination with abnormal metabolites, the displacement of the bodies to be oxidised away from the oxidising surfaces might all lead, therefore, to an imperfect and slow recovery from exertion, to dyspnœa associated with exercise.

APPLICATIONS.

All of us can suffer from dyspnœa and all of us can exhaust ourselves very rapidly; the finest athlete in the world may be almost incapable of movement within 60 seconds from the beginning of a race. The same degree, however, of exhaustion may be produced by a much lower level of exercise, no more rapidly but just as effectively, in a person of lower oxidative faculty or with poorer buffers in his tissue. When I was lecturing recently in Holland on this subject it was remarked, after one of my lectures, that it was typical of an Englishman, when he had found an interesting bit of physiology, immediately to want to apply it to sport. Perhaps some of you will sympathise with the motive—there are worse ones—even if it be true. There is a better motive, however; athletes and healthy men give us the cleanest experiments. If one took a patient from the hospital and made him work till he could barely move, one could never be sure (*a*) that he had really driven himself to his limit—it requires an athlete to know how to exhaust himself; (*b*) that one would not kill him; and (*c*) what the cause of his stopping was. With young athletes one may be sure—if one knows one's men—that they really have gone "all out," moderately certain of not killing them, and practically certain that their stoppage is due to oxygen-want and to lactic acid in their muscles. Quantitatively the phenomena of exhaustion may be widely different, qualitatively they are the same, in your athlete, in your normal man, in your dyspnœic patient. You can only *observe* your patient, but you can *experiment* with your athlete; you can "try out" on him the facts and theories you have reached with frogs. There I must leave it, and be grateful if the young athletes in their turn can suggest further experiments on frogs. I should be afraid to try such experiments as I have described on your patients, and I do not for a moment suppose that they, or you, would let me. The fact, however, that you have done me the honour to invite me to give these lectures is a sign, I am happy to think, that you believe in some future application, to your own urgent problems, of the study of the recovery process in normal man. Even such experiments as these may lead, in the end, to the alleviation of human suffering. After all, it is a much longer trail from a small portion of a frog to a young athlete, than it is from him to a patient in a hospital. Faith in the consistency of nature has been rewarded on the one trail; it cannot fail to be rewarded on the other.

CHLORIDE METABOLISM IN RONTGEN RAY THERAPY.

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Dodds and Webster [1] have recently summarised the literature of radiation sickness in THE LANCET, and Schmitz [2] at the same time published a similar summary in *Radiology*. The three cases of sickness examined by the first-named authors showed no metabolic disturbance. Schmitz's summary is inconclusive as to the cause of the sickness. Dodds and Webster do not appear to have seen a paper by Cori and Pucher [3] which appeared in September last, and in which the results appear to indicate that Rontgen radiation produces a definite chloride retention, more marked when sickness occurs. Since they themselves obtained a transient increase in chloride excretion, while our own results confirm those of Cori and Pucher, it seems desirable to give a brief preliminary account of our work, which is directed primarily to the problem indicated in the title to this note.

The only other paper that we have been able to find bearing directly on this problem is by Schlagintweit and Sielmann,[4] who state (we have only seen an abstract) that in severe disturbances following large doses of X rays there is a decrease in the chloride content of the blood, and that sodium chloride given in any form gives full relief. Dodds and Webster give no details as to the X ray dosage they employed, and we are unable to suggest an explanation for the disagreement between our results and theirs.

We have studied so far 12 cases. The first three, a case of sarcoma of the superior maxilla, a case of uterine fibroid, and one of carcinoma of the uterus involving the whole pelvis, were studied especially to see if there was any change of pH value of the urine which might indicate an acidosis. No such change was observed in these or the later cases; we have observed no production of ketonuria; and the second and third cases were examined specially for lactic acid excretion, and no increase was found. Our evidence tends to show no production of acidosis.

Conclusions as to Effects of Rontgen Ray Therapy.

At this time we saw Cori and Pucher's paper, and the remaining nine cases have been examined especially with a view to testing the accuracy of their results with chloride excretion. Our data will be published in full shortly. We do not yet regard them as sufficient to permit definite statements, but we have drawn certain tentative conclusions, and we quote below several abbreviated case reports supporting these conclusions, which are:—

1. Rontgen ray therapy in massive doses produces a definite lowering of urine excretion (confirmation of Dodds and Webster) and a definite chloride retention (confirmation of Cori and Pucher) when the upper abdomen is rayed. Radiation of other parts of the body produces less effect.
2. With radiation of the upper abdomen, where the previous chloride excretion is low, the tendency to sickness, other things being equal, is greater.
3. Preliminary feeding of sodium chloride daily, so that the chloride excretion is raised to ten or more grammes per day before treatment is commenced, with continued administration during treatment, prevents or lessens the sickness.
4. The blood chloride is not invariably affected, though sometimes the percentage is lowered.

Total nitrogen and phosphate results were too inconstant to permit conclusions, but there was usually a slightly greater nitrogen excretion during the radiation period.

Case Reports in Support of Conclusions.

CASE 1.—C. L., male, aged 58, with carcinoma of the first part of the transverse colon, the mass extending upwards in the region of the gall-bladder, with marked glandular involvement, was given X ray treatment confined to the right side of the abdomen. Two 13 cm. ports of entry were used, one anterior and one posterior. 150 k.v. with filters consisting of 0·75 mm. Cu and 1 mm. Al were used on the anterior port, and 200 k.v. with 1 mm. each Cu and Al on the posterior port. In all 16 m.a. hours were given by the fractional method, in six treatments spread over eight days. The chemical findings are shown in Table I.

TABLE I.

—	Urine volume.	Total N.	P_2O_5.	NaCl.
	c.cm.	g.	g.	g.
Feb. 27th (day preceding treatment)	1190	6·78	1·09	8·90
First day of treatment	1090	7·73	1·13	9·31
Average, next seven days ..	750	7·52	1·51	5·24
Day following last treatment..	1120	11·27	2·25	7·90

The patient was not sick and ate well throughout the treatment. The results show a definite chloride retention, but the lowest excretion figure (penultimate day of treatment) was still 3·82 g.

CASE 2.—Mrs. A. M., aged 40, with carcinoma of cervix, had had treatment six months previously with radium. Deep X ray therapy was advised to the whole pelvis. Her general condition was good. The "cross-fire" method of fractional dosage was employed, using two 10 cm. ports anteriorly and one 13 cm. port posteriorly. The factors used were 200 k.v., and a filter of 1 mm. each Cu and Al, with target skin distance 50 cm. In all 18 m.a. hours were given, divided into six treatments spread over eight days. The chemical findings are shown in Table II.

TABLE II.

—	Urine volume.	Total N.	P_2O_5.	NaCl.
	c.cm.	g.	g.	g.
Average—				
2 days preceding treatment	936	5·04	1·48	4·11
First 4 days of treatment ..	792	6·06	1·71	3·69
Next 3 days of treatment ..	1053	5·08	1·22	5·66

The patient ate well throughout the treatment and was not sick. There was at most a slight transient lowering of urine volume and chloride excretion. The effect was much less than in Cases 1, 3, and 5; the upper abdomen was not rayed.

CASE 3.—H. P., aged 57, had a mass in the epigastrium, and X ray examination with a barium meal showed a large gastric filling defect, involving the lower two-thirds of the antrum of the stomach, and suggesting an extensive new growth, with possible involvement of the liver. He was given at first nine treatments spread over ten days, using nine 10 cm. anterior ports and four 10 cm. posterior ports, in all 32·5 m.a. hours, the factors being 100 k.v., 30 cm. focal distance, and 4 mm. Al filter. X ray treatment produced an immediate decrease in urine volume and chloride excretion. There was vomiting on the second day of treatment, and thereafter for eight days the patient was nauseated and ate little. During this period the urine volume slightly increased, but the chlorides remained low. By the end of the first period of X radiation food was better taken, but chloride excretion remained low. Five days later, on account of the destruction of the formed elements of the blood, quartz-lamp treatment was given (on alternate days, commencing three minutes back and front, and increasing by three minutes per treatment to 18 minutes). There was an immediate beneficial effect on the blood. The patient ate better. But the chloride excretion dropped to a still lower figure, and was not much increased by giving daily five and then six grammes of sodium chloride by mouth. (We cannot explain this effect. We have tested lamp treatment alone on two other patients and have found no effect on chloride metabolism.) A subsequent period of X ray treatment, similar in degree, was not marked by any degree of sickness, but was accompanied by a further diminution of chloride excretion. The chemical findings are summarised in Table III., and, accepting the figure 3·80 as a *minimum* for the chloride obtained from diet, there would appear to be a retention of not less than 100 g. of sodium chloride during the observation period.

TABLE III.

Dates.	Condition.	Urine volume.	Averages— Total N.	P₂O₅.	NaCl.	Probable total NaCl retention.
Feb.		c.cm.	g.	g.	g.	g.
10	Day previous to tr.	1335	9·85	1·80	8·84	—
11	First day of tr.	548	6·42	0·84	1·74	7
12	Vomited. Specimen destroyed.	—	—	—	—	—
13–20	Nauseated and E.P.	612	9·58	1·61	2·75	—
20	Last day X ray.	—	—	—	—	—
21–25	Eating better.	806	8·55	1·07	3·80	—
26–29	Lamp tr. E.W.	405	6·55	1·19	1·14	11†
Mar.						
1–4	Lamp tr. 5 g. NaCl per day. E.W.	697	7·50	1·28	2·54	25†
5–9	Lamp tr. 6 g. NaCl per day. E.W.	520	6·64	1·05	2·15	38†
10–12	Lamp tr. X ray. 6 g. NaCl per day. E.W.*	(417)	(4·53)	(0·71)	(0·63)	26†

tr. = Treatment. E.P. = Eating poorly. E.W. = Eating well.
* Urine specimens incomplete. † At least.

After the second period of X ray treatment the patient was discharged from hospital. He was readmitted a fortnight later, his general condition being much worse. Laparotomy showed that the growth involved the whole of the stomach, and that gastro-enterostomy was impossible. He died six days later. During this period one 24 hours' specimen of urine was obtained, very small in amount, and showing no detectable trace of chlorine. Autopsy confirmed the original diagnosis and laparotomy findings.

The marked features of this case are the lessened sickness during the second period of treatment when much more chloride was being ingested, and the great apparent retention of sodium chloride. We have endeavoured to trace this chloride. Chlorine might be excreted in the fæces in undue amount, in the urine in organic combination (Cameron and Hollenberg have shown that normal urine contains no organic chlorine[5]), or through the skin with excessive perspiration. No excessive perspiration occurred. A sample of fæces examined for total chlorine during the second period of radiation showed no more than the normal chlorine excretion by this channel. The urine examined at this time contained no organic chlorine.

Bearing in mind the dry chloride retention which occurs in glomerular nephritis, with the accompanying fibrosis, and the fact that normally such tissues as skin, hair, and nails contain the highest chlorine content of any in the body, it seemed possible, as Dr. C. R. Gilmour suggested to us, that the chlorine might be taken up in the fibrosing of the tissues resulting from the radiation. Some of the carcinomatous tissue and also some kidney and muscle tissue of this patient were examined for total chlorine. It was high in all; it was not so abnormally high in the carcinomatous tissue as to offer a definite explanation of the chlorine retention observed. Though this explanation appears to be the most probable, yet if the retained chlorine can be regarded as anchored in some insoluble substance remaining in the body, then this would appear to be widely diffused. The blood chloride of this patient showed no definite change during treatment.

CASE 4.—J. C. L., aged 59, with carcinoma of the stomach, was, at the commencement of observation, excreting about 3 g. of sodium chloride per day. 5 g. were given by mouth daily throughout the observation period. On the ninth day he excreted 9·5 g. Three X ray treatments were given on the succeeding three days; his chloride excretion averaged 7·61 g. and the urine volume was not much affected. The average for the succeeding four days (no treatment) was 7·75 g. Then two further X radiations were given; chloride excretion averaged 8·70. During the whole period he ate well. On the third day of treatment he was slightly nauseated at breakfast, but otherwise showed no trace of sickness. The X ray dosage was less than in the previous cases, in all only 10 m.a. hours, with 150 k.v. His blood chloride previous to treatment was 0·50 per cent. The day after cessation of treatment the figure was 0·39, and next day 0·45 per cent. The corresponding blood-urea nitrogen figures were 12·9, 17·1, and 14·3 mg. per 100 c.cm. The samples were all taken just after the midday meal.

CASE 5.—I. K., aged 52, with carcinoma of the stomach, probably of the pyloric end, had had a gastro-enterostomy performed some time previously. He was in poor condition, frequently vomiting after meals. At the commencement of our observations he was excreting on a light diet from one to three grammes of sodium chloride per day. On May 29th the epigastric region was radiated through three 10 cm. ports, with 100 k.v., 30 cm. focal distance, 4 mm. Al filter, and 3·75 m.a. hours. On June 2nd the treatment was repeated, with 5 m.a. hours, and the other factors unaltered. His condition got steadily worse, the vomiting continued, and he ate very little. On June 6th, after the blood analyses were completed, sodium chloride was given by mouth, and the dose was steadily increased. On June 9th the patient's appetite commenced to return, and increased to the 12th; then it gradually lessened.

The blood and urine results, as contrasted with the sodium chloride intake (other than the slighter amounts ingested with food) are shown in Table IV. The blood samples were all taken shortly after the midday meal.

TABLE IV.

Date.	NaCl per cent.	Blood (per 100 c.cm.). Non-protein N.	Urea-N.	Urine. Vol.	Total N.	NaCl.	NaCl ingested.
		mg.	mg.	c.cm.	g.	g.	g.
May							
26	0·48	54	18·6	—	—	—	—
30	0·50	44	29·5	—	—	—	—
June							
2	0·49	48	14	670	11·37	2·21	—
3	0·47	47	24	345	5·37	1·07	—
4	0·47	59	36	1040	14·37	1·68	—
5	0·50	75	34	790	11·65	0·81	—
6	0·43	115	—	940	—	1·48	10
7	—	—	—	660	6·73	3·96	12
8	—	—	—	1000	10·83	6·94	12
9	0·53	33	14·1	810	7·63	5·86	18
10	—	—	—	660	4·84	6·61	26
11	—	—	—	1950	10·84	22·78	29
12	—	—	—	1770	8·92	16·67	12
13	0·51	—	14·3	1350	8·97	11·50	6
14	—	—	—	1080	9·68	6·72	6
15	—	—	—	1110	12·65	4·75	6

It would thus appear that, following the second X ray treatment, the blood non-protein and urea nitrogen steadily rose, and the blood chloride slowly decreased. After four days' heavy administration of sodium chloride the values for these blood constituents became normal, while there was a concurrent improvement in the patient's condition with cessation of vomiting and development of appetite. The patient's temperature, which had become subnormal (96°–97° F.) returned to normal, and the pulse improved.

During the period June 6th to 10th inclusive the patient received 78 g. of sodium chloride by mouth, in addition to that contained in his food, while he excreted 24·9 g. in the urine and lost none by vomiting. Soap-sud enemas were given on the 6th and 8th, with paraffin by mouth at intervening periods for constipation. The chloride loss by this channel can only have been slight, as the complete return from an enema on June 14th contained only 0·15 g. NaCl. The urines of June 7th, 8th, and 9th were analysed for total chlorine, and gave figures agreeing within the limit of error with the chloride determinations. The sudden return of the chloride excretion on the 11th to a figure of the same order as the intake is striking.

These results support the second of our conclusions, and indicate that the sickness due to X radiation can be cured rapidly by massive administration of sodium chloride, while they afford definite evidence of a chlorine retention during the recovery.

Discussion of Results.

Assuming that our conclusions are correct it may perhaps be permitted to speculate very briefly on the cause of the chlorine retention, and the apparently beneficial effect of sodium chloride therapy. The observations on Case 3 indicate that the chlorine is definitely retained in the body, and not excreted through some unusual channel. A chloride retention occurs in œdema, and Anderson[6] has noted œdema following intensive Rontgen radiation. No such œdema was observed in Case 3; the large retention would necessitate an excessive œdema.

Vomiting suggests itself as a means of chloride loss, but in Case 3 there was marked retention over long periods during which no vomiting occurred, in Case 5 there was similar retention, and in Cases 1 and 4 with slight retention there was no vomiting at any time. An obvious source of error is diet variation. The diets of these patients were controlled as far as possible, and no slight variations would account for our results, especially those with Cases 3 and 5.

Such results suggest immediately a comparison with the chlorine retention which occurs in acute pyloric and intestinal obstruction, as shown in a recent series of papers by Haden and Orr.[7] Here also, in addition to the retention, there is lowering of blood chloride, with an accompanying increase in the non-protein and urea nitrogen, and here also the accompanying intoxication is ameliorated, and in some cases cured, by administration of large amounts of sodium chloride, and of sodium chloride specifically. Dixon[8] has confirmed this beneficial effect (though Copher and Brooks[9] are not altogether in agreement).

According to Haden and Orr the detoxication change can be represented by an equation (which we have slightly modified)—

$$X + n(NaCl) + n(H_2CO_3) = H_n.X.Cl_n + n(NaHCO_3),$$

where X is the toxin, and $H_n.X.Cl_n$ is non-toxic. Their cases show an increase in carbon dioxide combining power of the blood after sodium chloride administration such as would be indicated by the above equation.

Obviously, if X radiation produces a toxin which also reacts with sodium chloride, then, if the reaction proceeds sufficiently, there should be *not only* a chlorine retention, but also a lowering of blood chlorides. Our results, added to those of Cori and Pucher, strongly suggest the occurrence of the former, and they imply that at any rate in some cases Schlagintweit and Sielmann's statement as to blood chloride is correct (cf. Cases 4 and 5).

It seems desirable to make a further accurate comparison of the chemical events in the two conditions, and to consider the possibility of a common underlying cause, at any rate where the upper abdomen is concerned, especially since Warren and Whipple[10] emphasise the sensitiveness of the intestinal epithelium to short-wave X rays. Such further work is in progress.

We wish to thank those doctors of the Winnipeg General Hospital who have allowed us to make these observations on their patients.

References.

1. Dodds and Webster: THE LANCET, 1924, i., 533.
2. Schmitz: Radiology, 1924, i., 137.
3. Cori and Pucher: Amer. Jour. Roentgenol., 1923, x., 738.

(Continued at foot of next column.)

THE DIAGNOSIS OF ADDISON'S (PERNICIOUS) ANÆMIA

BY A NEW OPTICAL METHOD.*

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PATHOLOGIST TO THE PRETORIA HOSPITAL.

Addison's anæmia is diagnosed on a combination of clinical symptoms, which are not pathognomonic, and changes in the blood, which are. Hurst[1] says:—

> "The most characteristic features of the blood in Addison's anæmia are now recognised as being the great inequality in the size of the red corpuscles—the anisocytosis—due to the presence of microcytes and megalocytes, and the increase in their average size in spite of the presence of some cells far smaller than the smallest cells found in normal blood."

Price-Jones has studied the size of red blood-cells.[2 3 4 5] He draws the outline of 500 cells of a dried film, magnified a thousand times, and measures these with a millimetre scale, up to ½ mm. The mean diameter of these 500 cells is taken to represent the average diameter of the blood-cells of the person tested. He found the mean diameter in Addison's anæmia larger than in health.[5] This was confirmed in an indirect way by Campbell.[6] Price-Jones has also recorded his results by means of graphs indicating the number of cells of each size. Applied to cases of pernicious anæmia this method gives extremely valuable results, confirmed by Hurst.[1] The method, however, entails too much work for regular clinical use.

New Method of Determining Size of Red Blood-cells.

I venture to call attention to another, much simpler method of detecting the changes in the red cells which are typical of Addison's anæmia. It can be executed with the apparatus available in most laboratories, and, although not giving the precise details of Price-Jones's graphs, it would appear that with it the diagnosis of Addison's anæmia can be made from an unstained blood film in a few seconds.

Principle of Method.—An ordinary blood film can be used as a diffraction grating. When a beam of parallel rays of white light strikes a diffraction grating at right angles, and a positive lens is placed at the back of the grating, a series of spectrums will appear on a screen placed at the back of the lens at its focal distance. The size of the spectrums is a function of the size of the elements of the grating. A blood film used as a grating produces circular concentric spectrums, and their size is an expression of the average diameter of the red blood-cells constituting the grating. The formula, which on physical grounds applies in such cases, is:

$$d = \frac{l\sqrt{4f^2 + D^2}}{D}$$

in which (d) is the diameter of the blood-cells, (D) the diameter of the coloured circle in the spectrum of

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* Some of the apparatus used in these experiments were bought by aid of a grant from the Union Government Research Grant Board.

(Continued from previous column.)

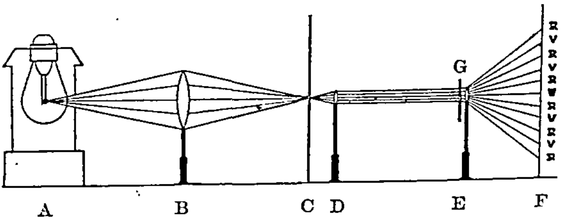
4. Schlagintweit and Sielmann: Berl. klin. Wochenschr., Oct. 21st, 1922, through Jour. Amer. Med. Assoc., 1922, lxxix., 2257.
5. Cameron and Hollenberg: Jour. Biol. Chem., 1920, xliv., 239.
6. Anderson: Arch. Radiol. Electrotherapy, 1923, xxviii., 217.
7. Haden and Orr: Surgery, Gynecol., Obstetrics, 1923, xxxvii., 465; Jour. Exp. Med., 1923, xxxvii., 365; 1924, xxxix., 321; Jour. Amer. Med. Assoc., 1924, lxxxii., 1515.
8. Dixon: Ibid., 1924, lxxxii., 1498.
9. Copher and Brooks: Ann. Surgery, 1923, lxxviii., [illegible]
10. Warren and Whipple: Jour. Amer. Med. Assoc., 1923, lxxxi., 1673.

which (l) is the corresponding wave-length, and (f) the focal distance of the lens used. Twice the value of (l) must be substituted if the second spectrum is used for measuring purposes instead of the first. From the formula (d) can be calculated from (D). It is not claimed that a blood film forms a perfect diffraction grating, but for practical purposes it is surprisingly suitable.

Technique of Method.

In Fig. 1 the beam of parallel white rays is produced by focusing the source of light (A) (I use a Pointolite lamp of 100 c.p., but any other strong light or sunlight will do) by means of a condenser (B) on a narrow opening in the screen (C), and the emerging cone of light is rendered parallel by the small lens (D). A similar small lens (E) focuses the beam on the white screen (F). As it is necessary to exclude all other light from (F), it is convenient to work in a dark room, and (C) is suitably made the wall between the laboratory and the photographic dark room. The arrangement of the apparatus matters little, the only essential points are the parallel beam and a suitable focusing lens (E). Any lens with a focal distance of from 20 to 50 cm., and a diameter of from 1 to 2 cm. is suitable. The beam must be made to have a corresponding diameter of from 1 to 2 cm. A blood film placed at (G) will produce a series of three concentric circular spectrums round the bright white spot (W), the colours of which are indicated by the letters (R) and (V), meaning red and violet. Slight movements of the film will help to find the most suitable area to be exposed. The first spectrum loses its violet section in the central white spot (W), the second spectrum is complete and suitable for measuring, the third spectrum is rather pale. Permanent records can be obtained by means of Lumière's colour photographic plates. If a suitable area of 1 cm. diameter, where the cells are closely packed, is exposed, the number of cells enclosed is over a million. With a lens of about 30 cm. focal distance the second spectrum measures about 8 cm., and the diameter of its coloured circles can be estimated with an accuracy of about 1 mm. A red blood-cell measures about 8 microns. The diffraction method of measuring red blood-cells may therefore be said to permit the combination into one picture of the images of more than a million red blood-cells, all magnified 10,000 times. From the formula the mean diameter of over a million cells can be calculated with an accuracy of about one-tenth part of a micron.

FIG. 1.

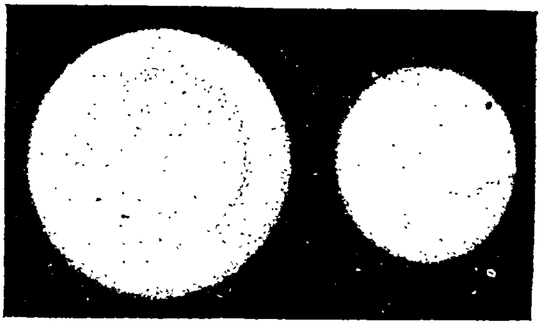


Practical Results of Method.

With a normal blood film and a focusing lens of 27 cm. focal distance the green circle of the second spectrum measured 74 mm. From the formula it followed that here the mean diameter of over a million normal red cells was 7·7 microns. Blood films from several normal persons showed only minor differences in this respect. These may be due to the diurnal variation in the size of the blood-cells described by Price-Jones.[3] Blood films made from one person in one sitting showed no such discrepancies. Fig. 2 (left) is a photograph of such a normal spectrum, taken with a lens of about 25 cm. focal distance. The dark ring is the blue and violet part of the second spectrum.

In Addison's anæmia the poikilocytosis will naturally prevent the formation of regular, bright spectrums, and the megalocytosis will tend to produce smaller spectrums than normal. The microcytes will again detract from the purity of the colours. Theoretically, therefore, blood films in Addison's anæmia should produce smaller and at the same time paler spectrums than normal blood. This is exactly what happened in the three cases of Addison's anæmia to which the method was applied.

FIG. 2.



Spectrums of normal blood (left) and of blood in Addison's anæmia (right).

These three cases presented the following features: Lemon colour of skin; general weakness; hæmoglobin 29, 32, and 40 per cent. respectively; red cells 2·5, 1·2, and 1·4 million respectively; poikilocytosis, anisocytosis, and polychromatophilia marked; microblasts and megaloblasts present but not always numerous; relative lymphocytosis; no free hydrochloric acid in stomach; large number of hæmolytic bacteria, mostly streptococci, obtained from duodenum; van den Bergh's indirect reaction positive. With blood films from these three cases and a focusing lens of 27 cm. focal distance the green circle of the second spectrum measured 52, 53, and 63 mm. respectively. According to the formula, therefore, the blood-cells measured 10·8, 10·6, and 9 microns respectively. In addition to this the spectrums were very pale, as can be judged from Fig. 2 (right), which is a photograph of one of them, taken under conditions identical to those of Fig. 2 (left). The dark ring is again the blue and violet part of the second spectrum. The thin blood of Addison's anæmia makes bad films. Normal blood diluted three times with serum made equally bad films, but the dilution had no appreciable effect on the size or brightness of the spectrums produced.

Neither fixing nor staining improves poor films. The spectrums may even become weaker thereby, and the second spectrum be too pale for measuring purposes, but in that case the red ring of the first spectrum can be employed instead. Blood films from 15 cases of anæmia, other than Addison's, were used as controls. They included cases of malignant disease and malaria, with hæmoglobin contents as low as 30 per cent. In not one of these cases were the size or nature of the spectrums in the least similar to those observed in the three cases of *Addison's* anæmia.

These results certainly seem to make the method worthy of further trial. Old stained films can be used for this purpose, but it must be remembered that these must not be exposed to a strong light for a long time, as this seems to affect the shape and size of the cells in some cases.

References.—(1) A. F. Hurst: Brit. Med. Jour., 1924, i., 93. (2) C. Price-Jones: Ibid., 1910, ii., 1418. (3) C. Price-Jones: Jour. Path. and Bact., 1920, xxii., 371: (4) ibid., 1921, xxiv., 326; (5) ibid., 1922, xxv., 487. (6) J. M. H. Campbell: Brit. Jour. Exper. Path., 1922, iii., 217.

iated as disgraceful, and not regarded as patho- gically excusable by the offender. However this ay be, the prison medical officer, who to some xtent rightly measures his vocational success by he ease with which he gets into sympathetic touch ith his prisoner during the mental examination, nds some of his most disappointing cases in this spect among the perverts and inverts.

Realising this—realising, moreover, the difficulty dealing with the inherently disagreeable material an attractive form—I have nevertheless attempted this paper to make a few observations on exhi- itionism based on the clinical examination of a rge number of cases through many years, but rticularly on a recent series of 150 remand and ial cases.

I need offer no excuse for the importance of the ubject. Sexual offences generally are not only umerous, but may have far-reaching results. They equently involve as victims women, and children f both sexes, and are liable to fix vicious associa- ions in the minds of the suggestible, sometimes eaving a permanent impression thereon. And there s reason to believe that one has been able to trace a onnexion between such and a course of sex delin- uency lasting over some years.

Frequency of Sexual Offence.

During 12 months a record was kept by me of the umber of sexual offenders who were received for rial or on remand at Brixton Prison, in order to ave some guide as to the comparative frequency of his class of crime. The prisoners were all males; here were 291 cases, and the offences were as follows:

Indecent exposure	107
Indecent assault on females	69
Carnal knowledge and attempts	42
Indecent assault on males	37
Immoral soliciting	19
Unnatural offences	17

During the same period the total trial and remand prisoners received for other offences were 7401, and the sexual offences, therefore, were about 4 per cent. This number appears perhaps small, but it should be remembered they are all cases of some seriousness, whereas not a few of the others are comparatively trivial, such as those due to drink, vagrancy, and petty theft. An inquiry was made into the mental condition of the sexual offenders as a matter of routine, and in 101 of these cases the courts themselves had called for a report on their states of mind. In my experience the judicial authorities, and advocates practising in the criminal courts, are ever on the alert for evidence of mental disease or defect in these cases.

For the purposes of this paper the term exhibitionism is used as synonymous with indecent exposure of the genital organs. This does not appear to be always accepted. By some authors the term is only used in cases in which a psychopathic origin is diagnosed or assumed, but I would suggest that this is liable to lead the student to regard all exposure ases as pathological, which I shall endeavour to how is not the fact, and it also tends to bring about faulty perspective. It is somewhat remarkable at whereas in the criminal courts the adminis- tors of the law were so doubtful as to the mental lition of 60 of the 107 cases mentioned in the table as to call for a report thereon, yet text- on insanity usually either dismiss the subject lines or fail to mention it at all. In actual all such cases should, of course, be suspect eful examination into their mental condi- n conducted, for, as will be seen later, the r of those dealt with under the Lunacy Deficiency Acts is considerable, apart are merely subnormal or in need of ic treatment.

e Underlying Motive.

xual instincts, and morbid sexual bly more frequently met with in elsewhere. Putnam observes[1]:

"It is true, however, those who have not looked into the matter may think otherwise that, in the eye of science, perverted instincts such, for example, as an excessive passion for a person of the same sex, carried from the realm of thought into act, finds its analogue in many overdone or even quasi-normal relationships of daily life. It is a question of degree that is at stake, and although for purposes of punishment, prevention, public self-protection and social standards we must draw sharp lines, yet knowledge should make us prudent in passing scientific judgments."

To obtain a reasonably clear conception of many sexual crimes it seems to me important to bear in mind the composite character of the sexual instinct, and to regard many sexual offences as being related to the imperfect and irregular development of the components, due to pathological heredity and accidental associations, forming new sexual aims. When also circumstances prevent the release of sex energy along the normal channels, a diversion resulting in a criminal offence seems to take place through an infantile outlet in certain individuals already predisposed.

It will be well before discussing the exhibitionist to briefly consider the manner of the act of exhibitionism itself. This act consists, as I have said, in the indecent exposure of the genital organs nearly always by males to women, girls, or young children of either sex, by appearing from behind some bush, or whilst sitting on some seat in the public parks and commons, or from the entrance to a urinal or other narrow entry, or in the public highway, frequently by throwing open the coat by the aid of the hands in the pockets revealing the genital organ erect, or otherwise, outside the trousers. The act is sometimes committed indoors, the exposure being from a window, the lower part of which is often opened for the purpose. Less commonly it occurs in a railway carriage, tram, or 'bus to other passengers, not infrequently from a railway carriage as it passes a particular locality. The act is frequently repeated in the same district, at the same time of day, to the same person, a fact which has enabled the police over and over again to wait in hiding for its repetition, and then arrest the offender. It is often accompanied by lewd gestures and even masturbation may be indulged in, and sometimes female spectators are considerably frightened by the occurrence, and are very disinclined to give evidence in court about the matter, or to make their preliminary complaint to the police. Words sometimes, but rather infrequently, accompany the act. If used they are often indecent. A movement towards the woman is sometimes made, and at times an indecent assault is attempted. In some cases the act is apparently impulsive and spontaneous, in others premeditation and preparation can be demonstrated.

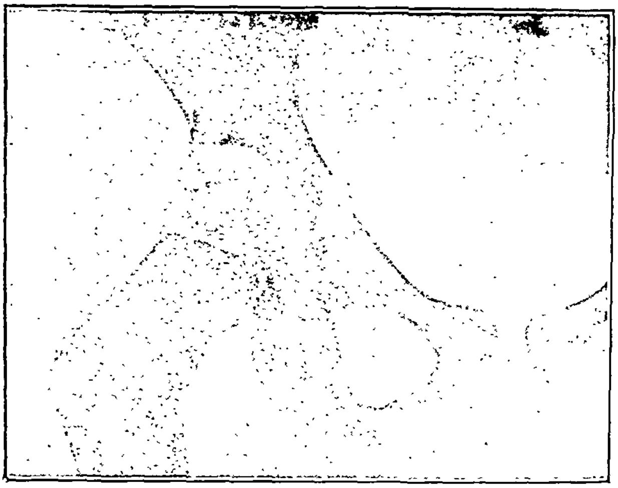
General Observations.

A few general observations on the 150 cases may be of interest before considering individual types. The offence is often so clearly abnormal that a high percentage of mental disease or defect might be expected in the family histories of the offenders. In only 19, however, was insanity or epilepsy or both, with or without intemperance, admitted. In five additional cases intemperance alone was recognised. These figures give the disappointing result so frequently found when making an inquiry into criminal cases, for not only are many unwilling to admit family defects, but several in the class from which most of the cases are drawn lose touch with their kinsmen early in life, and are unable to give any reliable information on the matter.

An analysis of the civil state of the offenders showed 90 were single, 57 married, and three widowers. Whilst the figures are too small to draw any conclusions therefrom, they do show a marked difference between those to whom regular sexual relations were available, and those whose comparative abstinence might be fairly assumed.

Points of special interest are: (1) Coincidence of pseudo-coxalgia and Köhler's disease. (2) Here the patient complained only of his right foot. His hips functioned normally, but clinical examination showed marked wasting of the right buttock and thickening of the corresponding trochanter, and the X ray revealed the abnormal picture described above.

FIG. 4 (Case 2).



Conclusion.

1. The study of these two cases, which were the only cases of either Köhler's disease or pseudo-coxalgia seen in the Meath Hospital during the past year, lends weight to Sorrel's advice to examine radiographically both hips and feet in all cases of either condition. 2. These two cases tend to support (but, of course, do not prove) the theory that the radiographical and clinical resemblance of Köhler's disease to pseudo-coxalgia is explained by a common ætiology. 3. I have met very few cases of apophysitis of the tibial tubercle, and those which have come my way have given a definite history of trauma and seemed to me to differ in no way from partial epiphyseal separation in other situations. Scudder may be quoted as taking a similar view, and Osgood lays stress on injury. The two cases noted above, however, were young to suffer from Schlatter disease so-called, and further study of them and similar cases will be necessary to establish or disprove a connexion between this condition on the one hand, and Köhler's disease and pseudo-coxalgia on the other.

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Scudder: The Treatment of Fractures, p. 532, ed. 9.
Osgood (quoted by Scudder).

GLYCOSURIA IN SUBACUTE NEPHRITIS.

BY H. A. COOKSON, M.B., F.R.C.S. EDIN.,
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AND
K. S. BROWN, M.B., CH.B. EDIN.,
ASSISTANT PATHOLOGIST TO THE INFIRMARY.

THE occurrence of glycosuria in the following case of subacute nephritis was found to be due to punctate hæmorrhage in the floor of the fourth ventricle.

S. S., a girl aged 19, was admitted to the Royal Infirmary on Dec. 11th, 1923, in an unconscious condition. There was a history of fits just before admission.

Previous Illnesses.—As a child she had corneal ulcers of eyes after birth, but was healthy afterwards, though later on she had measles and influenza. Patient did not menstruate until 17 years of age, and periods were subsequently irregular. Fourteen days previous to admission patient felt out of sorts and suffered from headaches, and consulted her doctor. She improved at first, but two days before admission she became worse, and at 6 P.M. was convulsed and comatose, and never properly regained consciousness. There was no history of epilepsy, poisoning, &c. Two uncles died of meningitis and an aunt from kidney trouble.

Condition on Examination (Dec. 11th, 1923).—Fits came on in succession, two or three at a time, without conscious intervals between. Pupils equal, contracted, reactive to light. Eyes deviated to left in a fit, and patient threw right arm, leg, and head about. These convulsive movements commenced with right arm and fingers. Knee-jerks were not elicited. Plantar response: Extensor on left and flexor on right. Blood pressure, systolic, 180; diastolic, 140. Pulse was full and bounding. There was œdema all over, especially face. There was retention of urine. A catheter specimen showed abundant sugar and albumin. The lungs were dull, and showed crepitations all over. There was evidence of cardiac distress. Dec. 12th: Pupils dilated. Eyes rolling. Temperature rising. Pulse very fast and thready.

Post-mortem Notes.

Body well nourished and dropsical. In the brain the convolutions are flattened and there is a subarachnoid hæmorrhage over the left motor area owing to a small vessel having given way. There is a small hæmorrhage in the fourth ventricle. The rest of the brain is normal except for minute hæmorrhages. Both lungs show œdematous changes and terminal bronchitis, &c. There are five or six ounces of fluid in each pleural cavity. The left side of the heart is hypertrophied. The valves are healthy, but there are signs of early vascular degeneration especially noted in the aorta. All the abdominal organs show evidence of dropsical changes, and there is free fluid present. The liver shows fatty changes and some venous congestion (chronic). Kidneys are diseased, and show acute and subacute changes. The pancreas showed no naked-eye changes, and histological examination did not disclose any degenerative or atrophic changes in the parenchyma, and the islets of Langerhans appeared normal. The urine showed evidence of nephritis, a very considerable amount of albumin being present; also sugar and acetone.

Summary.

The patient died of subacute nephritis, and that this had existed for some time there is distinct evidence. The sugar and acetone found in the urine are of scientific interest only; damage to the fourth ventricle being known to cause this condition.

We are indebted to Dr. J. B. Waters, honorary physician, Royal Infirmary, Sunderland, for the clinical notes of this case.

OBSERVATIONS ON EXHIBITIONISM.

BY W. NORWOOD EAST, M.D. LOND.,
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LATE SENIOR MEDICAL OFFICER, H.M. PRISON, BRIXTON.

(*With the permission of the Prison Commissioners.*)

SEXUAL offences, sometimes called, perhaps less happily, moral offences, seldom form the subject of an article in this country, and this is probably mainly on account of its distastefulness. But any investigation into the mental condition of any group of criminals is beset with difficulty also, for no sooner is a criminal action committed than the offender excuses his conduct, and subsequent arrest frequently causes denial of the action quite apart from any lack of confidence in the medical investigator. The offender, as a defence reaction, not infrequently endeavours to shut out from consciousness actual facts relating to the crime, and denies incontrovertible evidence as part of the repressing mechanism. Sexual offenders are particularly liable to react in this manner, and deny their offence, although they may be assured that an incriminating statement to the medical investigator will not affect them adversely. This untruthful denial of the act, whilst adding to the difficulty of the examination, may be a matter of some diagnostic importance, for an obsessional case usually admits and deplores his weakness, whereas a denial suggests shame for an act appreciated as disgraceful, and not regarded as pathologically excusable by the offender. However this may be, the prison medical officer, who to some extent rightly measures his vocational success by the ease with which he gets into sympathetic touch with his prisoner during the mental examination, finds some of his most disappointing cases in this respect among the perverts and inverts.

Realising this—realising, moreover, the difficulty of dealing with the inherently disagreeable material in an attractive form—I have nevertheless attempted in this paper to make a few observations on exhibitionism based on the clinical examination of a large number of cases through many years, but particularly on a recent series of 150 remand and trial cases.

I need offer no excuse for the importance of the subject. Sexual offences generally are not only numerous, but may have far-reaching results. They frequently involve as victims women, and children of both sexes, and are liable to fix vicious associations in the minds of the suggestible, sometimes leaving a permanent impression thereon. And there is reason to believe that one has been able to trace a connexion between such and a course of sex delinquency lasting over some years.

Frequency of Sexual Offence.

During 12 months a record was kept by me of the number of sexual offenders who were received for trial or on remand at Brixton Prison, in order to have some guide as to the comparative frequency of this class of crime. The prisoners were all males; there were 291 cases, and the offences were as follows:

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During the same period the total trial and remand prisoners received for other offences were 7401, and the sexual offences, therefore, were about 4 per cent. This number appears perhaps small, but it should be remembered they are all cases of some seriousness, whereas not a few of the others are comparatively trivial, such as those due to drink, vagrancy, and petty theft. An inquiry was made into the mental condition of the sexual offenders as a matter of routine, and in 101 of these cases the courts themselves had called for a report on their states of mind. In my experience the judicial authorities, and advocates practising in the criminal courts, are ever on the alert for evidence of mental disease or defect in these cases.

For the purposes of this paper the term exhibitionism is used as synonymous with indecent exposure of the genital organs. This does not appear to be always accepted. By some authors the term is only used in cases in which a psychopathic origin is diagnosed or assumed, but I would suggest that this is liable to lead the student to regard all exposure cases as pathological, which I shall endeavour to show is not the fact, and it also tends to bring about a faulty perspective. It is somewhat remarkable that whereas in the criminal courts the administrators of the law were so doubtful as to the mental condition of 60 of the 107 cases mentioned in the above table as to call for a report thereon, yet textbooks on insanity usually either dismiss the subject in a few lines or fail to mention it at all. In actual practice all such cases should, of course, be suspect until a careful examination into their mental condition has been conducted, for, as will be seen later, the actual number of those dealt with under the Lunacy and Mental Deficiency Acts is considerable, apart from those who are merely subnormal or in need of psychotherapeutic treatment.

The Underlying Motive.

Everyone has sexual instincts, and morbid sexual instincts are probably more frequently met with in prison practice than elsewhere. Putnam observes[1]: "It is true, however, those who have not looked into the matter may think otherwise that, in the eye of science, perverted instincts such, for example, as an excessive passion for a person of the same sex, carried from the realm of thought into act, finds its analogue in many overdone or even quasi-normal relationships of daily life. It is a question of degree that is at stake, and although for purposes of punishment, prevention, public self-protection and social standards we must draw sharp lines, yet knowledge should make us prudent in passing scientific judgments."

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It will be well before discussing the exhibitionist to briefly consider the manner of the act of exhibitionism itself. This act consists, as I have said, in the indecent exposure of the genital organs nearly always by males to women, girls, or young children of either sex, by appearing from behind some bush, or whilst sitting on some seat in the public parks and commons, or from the entrance to a urinal or other narrow entry, or in the public highway, frequently by throwing open the coat by the aid of the hands in the pockets revealing the genital organ erect, or otherwise, outside the trousers. The act is sometimes committed indoors, the exposure being from a window, the lower part of which is often opened for the purpose. Less commonly it occurs in a railway carriage, tram, or 'bus to other passengers, not infrequently from a railway carriage as it passes a particular locality. The act is frequently repeated in the same district, at the same time of day, to the same person, a fact which has enabled the police over and over again to wait in hiding for its repetition, and then arrest the offender. It is often accompanied by lewd gestures and even masturbation may be indulged in, and sometimes female spectators are considerably frightened by the occurrence, and are very disinclined to give evidence in court about the matter, or to make their preliminary complaint to the police. Words sometimes, but rather infrequently, accompany the act. If used they are often indecent. A movement towards the woman is sometimes made, and at times an indecent assault is attempted. In some cases the act is apparently impulsive and spontaneous, in others premeditation and preparation can be demonstrated.

General Observations.

A few general observations on the 150 cases may be of interest before considering individual types. The offence is often so clearly abnormal that a high percentage of mental disease or defect might be expected in the family histories of the offenders. In only 19, however, was insanity or epilepsy or both, with or without intemperance, admitted. In five additional cases intemperance alone was recognised. These figures give the disappointing result so frequently found when making an inquiry into criminal cases, for not only are many unwilling to admit family defects, but several in the class from which most of the cases are drawn lose touch with their kinsmen early in life, and are unable to give any reliable information on the matter.

An analysis of the civil state of the offenders showed 90 were single, 57 married, and three widowers. Whilst the figures are too small to draw any conclusions therefrom, they do show a marked difference between those to whom regular sexual relations were available, and those whose comparative abstinence might be fairly assumed.

The age incidence shows an interesting and constant diminution in the number of offences for each successive decade, viz.:—

From 16 to 25 years of age there were	57	cases.
,, 26 to 35 ,, ,, ,, ,, ,,	43	,,
,, 36 to 45 ,, ,, ,, ,, ,,	29	,,
,, 46 to 55 ,, ,, ,, ,, ,,	14	,,
,, 56 to 65 ,, ,, ,, ,, ,,	7	,,

These figures are, I think, such as would be expected, bearing in mind the gradual diminution in sexual activity as age advances.

In 26 cases the prisoner had been previously convicted of a similar offence, but in some of these the offence had been committed many years before, an interval of 20 years being noted in one case. The great majority in fact had not offended in a similar manner before, or at any rate, had not been previously arrested on this charge. May we not fairly conclude that possibly imprisonment has acted as a deterrent upon many exhibitionists? I feel it frequently has been curative. In 21 cases one or more convictions for other offences were admitted, and of these five were for sexual offences.

Sixty-eight prisoners admitted the offence, less than half. In 44 cases the act had been repeatedly committed at or near the time of arrest according to the prisoner's own admission, or from the evidence. This is probably an under-estimate. The reasons given for the offence by the prisoner are various, an accidental omission to re-button the trousers after micturition being a favourite excuse, as is also drink. The more candid admit masturbation, or an effort by the exposure to debauch others to commit a masturbatory act upon them. Sex gratification, sexual invitation to, and a desire to cause sexual excitement in, some woman or girl, and phantasy indulgence are also not uncommon admissions.

Classification.

For practical purposes cases of exhibitionism can be divided into two main groups:—

I. The psychopathic including—		
1. Psychoses	7	cases.
2. Undeveloped psychoses	7	,,
3. Psychoneuroses	5	,,
4. Mental defectives	24	,,
5. Subnormals—i.e., high-grade uncertifiable defectives	9	,,
6. Visionaries	40	,,
7. Alcoholics	9	,,
	101	

II. The depraved including—		
1. The exposure as a preliminary to an attempt at carnal knowledge	2	cases.
2. The exposure as an attempt to debauch children to commit a masturbatory act upon the exhibitionist	12	,,
3. The exposure as an attempt to attract, excite, or invite a female	35	,,
	49	

It is well to remember that within the psychopathic group itself many cases might be placed under more than one heading, and that not uncommonly a psychopathic as well as a depraved condition may be traced in the same individual. In the classification given I have put each case under the heading to which it seemed fundamentally to belong. I have no doubt that a large number were over-sexed, but this I look upon as a contributory state.

It is clear, I think, from the figures that the majority of exhibitionists are psychopathic, but the question of legal responsibility is not so clearly cut. The largest group, the visionaries, are, I believe, most easily cured by a term of imprisonment, and sometimes by a fine; by this means they are frequently made to appreciate the value of reality, and the vanity of phantasy formation.

With the psychotic and defective, treatment to be in any degree beneficial must be carried out on other lines, and punitive detention be avoided as unsuitable.

The subnormal psychoneurotic alcoholic and unstable require individual consideration. It will be generally agreed, I think, that the depraved group well merit imprisonment, but in the mixed psychopathic and depraved the best course to recommend, if asked by the court, is often a matter of anxious consideration.

The classification I have come to adopt differs from those usually proposed, or used. Krafft-Ebing[2] in describing the mental state of the exhibitionist; mentions three groups: (1) Acquired states of mental weakness such as senile dementia, paretic dementia, and alcoholism; (2) epileptic, epileptiform, and neurasthenic states; (3) impulsive conditions connected with degeneracy. Thoinot and Weysee[3] speak of six groups: (1) Idiots and imbeciles; (2) general paralytics; (3) senile dements; (4) alcoholics; (5) deliria of various categories; (6) epileptics and degenerates.

I have purposely avoided the use of the term degenerate, although I am well aware authorities such as Magnan and others have used it in this connexion in the past, but as far as I am able to appreciate, the recorded cases do not connote any precise clinical entity. It is a common practice to refer to criminals vaguely as degenerates, a loose term, I submit, which tends to thwart clear thinking or psychological investigation.

The Psychotic Group.

Of the 150 cases which form the material for this paper 14 were psychotic, in half this number the psychosis was fully developed, two were general paralytics, two paranoiacs, two were cases of dementia præcox, and one of senile dementia. In one of the *paretics* the futility of an exposure which is so often marked when occurring in this disease was well shown. The patient was 48, a single man, and was charged with exposing himself in a tube station. Whilst awaiting outside the doctors' examination room on reception into prison the same evening, he again exposed himself to about 30 other prisoners, making at the same time a lewd suggestion. He had been spending money freely and foolishly for some months before arrest, was grandiose, and exhibited the usual physical signs and a positive Wassermann reaction and was sent to an asylum. In the other case of general paralysis the exposure was probably due to an inability to appreciate social convention.

One of the *delusional* cases said he exposed himself in response to an order to do so from the Almighty. He described a struggle he made not to submit to the command, but eventually did so and said that then he would have exposed himself to 50 people if necessary. He considered the act to be symbolic, but of what I could not ascertain. The other patient with systematised delusions of persecution exposed himself probably as a sex invitation to a passing woman on a country road.

Of the cases of *dementia præcox*, one exposed himself in a flagrant manner walking along one of the most important streets in the metropolis, and gave as his reason that seeing the women in the street excited him, and the exposure "eased his nature." The other case exposed himself on a road to the people journeying to the races, and the only exciting reason for the act appeared to be the sexual stimulus of seeing so many women driving past.

The case of *senile dementia* occurred in a professional man who had lived up to the time of the offence in an exemplary manner, but whose mental powers were recognised by his associates to have been failing for some months before the offence.

It is of some interest to note that none of the 150 cases were due to *epilepsy*. As a student one was taught the connexion between epileptic automatism and exhibitionism, and one does, of course, meet with it from time to time, as in the case of a professional man who when overworked was apt to become automatic and then exposed himself, but in my own experience these cases are not as frequent as they are dramatic.

Psychoneurotic Cases.

The five psychoneurotic cases form a much smaller group than the literature would lead one to expect. Many prisoners at first say they exposed themselves on the impulse of the moment, and could not help doing so. Mental analysis may support their account as regards the spontaneity of the act without confirming the irresistibility of the impulse. There is, of course, in this connexion a special difficulty in dealing with sexual offences, as both normal and abnormal sexual impulses are recurrent and in the over-sexed may be difficult to restrain; moreover, organic relief may result from whatever sexual act has been indulged in, but very many cases, which at first sight appear to be psychoneurotic, show on analysis no effort to control the impulse, no distress at giving way to the desire, and imprisonment cures them. Such cannot be regarded as psychasthenic. Actual cases are, however, met with from time to time, I believe, and as a probable example I would cite that of a man of middle age whose wife after several years of happily married life denied him any further sex relations, for reasons which I need not go into. Within 18 months he was thrice found guilty of exposing himself whilst sitting on an outdoor seat with his trousers undone, but an enormous pendulous abdomen must have partially, if not entirely, concealed his genitals. He admitted the offence, said he deplored it and struggled against its commission, that he realised he was ruining himself by it, but that it relieved him, and he alleged he could not control himself. His statements were supported by the honest manner in which he spoke of his offences, the fact that punishment had been ineffectual, and that his account volunteered the essentials of a psychasthenic act, which he would be unlikely to know of unless his statements were genuine.

I have already mentioned that the exposure frequently recurs at the same place and at the same time of day, and this is sometimes looked upon as some evidence of an obsessional impulse. In my experience I find it usually means the act is done to attract, excite, or invite some particular female who is known to be in the neighbourhood usually at that time, and is not the result of an impulse originating from within, but a reaction to a particular external stimulus which has been assiduously sought after.

Mental Defectives.

An important group of 33 cases is formed by the mental defectives with those subnormals whose defect was considered insufficient to permit of their certification under the Mental Deficiency Act. Their exposures may be due to a lack of appreciation of social convention, to be contributory to masturbation, to obtain sex gratification or stimulate phantasy, to attract, excite, or invite some female or child, and occasionally it appears to be due to an infantile pleasure in showing off, as in the case of a defective youth who stopped men and women in an important street in a provincial city calling their attention to his exposed penis. In another defective the act appeared to be a retaliatory insult to some girls who the defective said were accustomed to laugh at him in the street, probably on account of his foolish appearance. The exposure in this case seemed fairly comparable to the less offensive putting out of the tongue at times indulged in by children. Whatever the exciting cause, personal experience leads me to consider it almost certain that any sexual offence committed by a defective will be repeated unless institutional care is adopted.

The Visionary Group.

The visionaries form an important group of 40 cases. They are those who derive sex gratification from the exposure and accompanying phantasy which may be preceded by or result in erection, and is sometimes aided by masturbation. From statements of accused persons themselves, and from the evidence of police officers who have effected arrests during the act of exposure, there can be no doubt that exhibitionism may result in ejaculation. There can also be no doubt, I think, that in these cases sex gratification results largely from phantasy indulgence, which the exposure stimulates and reinforces, and to some extent seems to serve as a bridge connecting phantasy and reality.

The cases vary in their crudity: A man, aged 32, who had served some years in the army in India and had there indulged much in sexual relations with native women, on his return home married, but owing to the ill-health of his wife and on economic grounds practised coitus interruptus. Walking across a common he picked up a continental book the pictures of which excited him, he exposed himself to some children and eventually went on to masturbation. He admitted nocturnal emissions as the result of exhibitionist dreams. In another case a youth, aged 22, whose only sex experience appeared to be that he once saw a woman at the seaside undressing to bathe, exposed himself from a window in his home to a woman in her back garden. He took all his clothes off, he said, to make things seem more real and to assist his imagination as to what the woman would say and do if she was in the room with him. Full sex gratification resulted from the act and accompanying thoughts. A widower, aged 53, exposed himself to two women, and then went on to masturbation. He said the presence of a woman rendered the act more realistic, as one was present during coitus and her presence during exposure assisted his imagination. A lad of 17, addicted to masturbation, exposed himself and said he became very excited if he thought a woman was looking at him then. Another youth of 18 was charged with exposing himself on three occasions from a railway carriage passing a particular locality close to his own home. He said he thought a girl might be watching him, and that his act would make her blush, and if he saw her then looking at him exposed he would obtain full sex gratification. The case of a youth of 17 who exposed himself on a heath was of some speculative interest, for although the act was apparently assisting phantasy, it appeared from his statement possible also that it resulted from emotional depression consequent upon the knowledge that he was about to lose his employment. It was his only known or admitted delinquency, and it seemed that perhaps grief had acted as a sexual stimulant, as it is occasionally said to do, and of which Havelock Ellis[4] quotes examples. Whether, in fact, this was so or not I have little doubt that when an emotional outbreak occurs as a temporary relief from a harassing situation, various sex offences occur from time to time as a result.

The cases in the visionary group have this in common, that phantasy indulgence is prominent, and, as I have already said, is stimulated by the exposure, and although in two or three cases I am open to the criticism that I perhaps could not clearly show that the exposure was accompanied by phantasy, yet I am inclined to think that really in those cases it was but that the phantasy passed unrecognised.

Whether this be so or not, all are familiar with the enormous influence that imagination has on sexual acts. That it is able of itself to produce sex gratification seems undoubted. Havelock Ellis refers to such cases,[5] and Placzek[6] remarks: "Many men can have sexual intercourse with their eyes." Bearing in mind the phenomenon of ejaculatio præcox it can hardly be a matter for surprise that when exhibitionism is accompanied by vivid phantasy, relief from sexual tension may result in certain psychopathic individuals.

The Alcoholic Group.

The most important point of interest in this group would seem to be the small number of cases—viz., nine. In a few cases classified under other groups an alcoholic element seemed possible, but only in a few. In this group alcohol appeared in important relation to the exposure. It is a matter of common prison experience that sexual offences are very frequently attributed to drink by the offender, often as a face-saving excuse, but also often with some truth. My own impression is that sexual offences were much commoner when liquor was cheaper and restrictions absent, and the official figures show in support of this that in the year 1913 in England and Wales 866 men were convicted for indecent exposure, whereas in 12 months 1922–23 only 548 were so convicted. Some such figures were anticipated, and it seems only fair to attribute them as being due, at least to some extent, to the lessened consumption of liquor, bearing in mind the aphrodisiac action of alcohol, and its influence in causing loss of higher control. If liquor was as easily obtainable now as in pre-war times I believe we should find more cases of exhibitionism. When alcohol is associated with the exposure I believe a genuine confusion does in fact at times occur, but I do not think as frequently as is alleged. In some cases a latent tendency towards exhibitionism appears to become manifest under the action of alcohol.

The Depraved Group.

In considering this group, it is well to recollect Putnam's exhortation already quoted, which seems particularly applicable in this connexion. Before placing any case in this group of 49 cases I have taken the utmost care to arrive at the truth. I have already said that in two cases the exposure was apparently a preliminary to an attempt at carnal knowledge. In 12 I considered it due either to an attempt to debauch a child to perform masturbation upon the exhibitionist, or in a few cases it may have been preliminary to an indecent assault on the child happily prevented by an interrupter. There is no doubt a verbal invitation to masturbation is sometimes made, and pence for sweets also occasionally offered as a bribe. From such cases as these are drawn some of the park pests whose activities are indulged in chiefly in the summer months, when children unattended gather together to play in the public gardens and spaces.

The largest number of cases in the depraved group—35—consists of those whose exposure was made to attract, excite, or invite some woman or girl. Some distinction in the degree of turpitude can be made in different cases. Thus a married man, aged 36, engaged at work in a top room, saw in the corresponding room across the street two women dressing of a morning nude to the waist. He waved to them and they waved back. He then exposed himself to encourage them to further advances, to which, however, they did not respond. The room of a youth of 18 looked on to an orphan school, and the girls therein, aged about 14, were said to have waved and then lifted their clothes up to him, upon which he exposed himself and was seen by an onlooker. A youth, aged 16, exposed himself on three occasions to a girl passing his window, and said he did so as he had heard other lads discussing it as an efficient means of sexually exciting a girl. A man of 38, seeing two maids looking out of a window, exposed himself to them, and when they failed to notice him passed on. Somewhat different are those cases in which a man is attracted by a particular female, and eventually exposes himself to her. Thus a youth, aged 16, accustomed to frequent a certain coffee-shop, became attracted by the waitress; after several visits in which he had never spoken to the girl except to give his order, he one day found himself the only customer in the shop, and exposed himself to her, thinking, he said, that he might attract her. A married man of middle age and respectable position, wont to travel by 'bus to town of a morning with a particular girl, became attracted by her appearance, and eventually exposed himself to her on more than one occasion as he sat beside her in the 'bus hoping to excite her. A single man, aged 30, who was able to recall exhibitionist dreams, passed the same woman several mornings on his way to work. She took his fancy, and when she had passed him he looked back to find her doing the same. After this had recurred on several mornings he exposed himself to her when she looked back, hoping to further attract her. Neither had spoken to the other. Such, then, and of such is this group composed. More detailed accounts of individual cases will not be required: in many they are revolting, but in not a few one is reminded of the courtships of the farmyard, and the love antics and "showing off" indulged in by certain animals to arouse sexual desire in the females of their species.

Diagnosis in Mixed Cases.

In some mixed cases diagnosis is particularly difficult. A married man, aged 32, an Army reservist when war broke out, with a history of syphilis, was arrested for exposing himself to some children in the street. The police reported that when taken into custody he seemed dazed and unable to appreciate his position and was allowed bail the same evening and taken to hospital by his relatives. On reception into prison he produced an X ray photograph which showed a bullet in the occipital region, and inquiries showed that some seven years previously he had been wounded in the war and remained unconscious for some hours. Ultimately the bullet was removed, and later a cerebral abscess opened. His mental condition since recovering consciousness after the injury had never given rise to comment; there was no history of epilepsy or dream states. He alleged amnesia for the offence; this and the dazed condition noted by the police may have been genuine, but were not at all convincing, and it was not clear whether or no drink had any part in the case. I found, however, besides the evidence of an operation behind the ear that both optic discs were reddened and the edges blurred, particularly on the injured side, and the vessels were small. There was some lateral nystagmus of the eye on the wounded side, the other cranial nerves were unaffected. There were tremors of the hands, chiefly on the injured side, in which also dysdiadochokinesia was observed. The knee-jerks were normal and the Wassermann reaction negative. He had some years before been convicted of stealing and also for living on the earnings of prostitution. I sent a mental report to the court in the prisoner's favour and he was bound over. Several months later he was again arrested for exposing himself on three occasions from a window where he was employed to a girl in an office opposite. He again denied all recollection of the occurrences, but on this occasion it was quite clear from his admissions and the surrounding circumstances that he had full recollection of his actions: whilst asserting an amnesia he alleged at the same time an obsession for the exposures, and blamed a psycho-analyst for failing to cure him. He was obviously untruthful, and when examined in my room stared around him in an obtrusively vacant manner, which was absent when he thought he was unobserved in the ward; he assumed a stammer which he soon forgot to continue, coarse tremors of the hands became less marked when no notice was taken of them, a suggestion in his appearance that he had been drinking was stronger than on the first occasion, and his attitude and demeanour were generally unsatisfactory. After this further period of observation, and with the additional material to hand, I came to the conclusion that there was much depravity in his case. I found no support for the alleged amnesia or obsession, and was unable to report favourably. He was sentenced to a term of imprisonment, which so far appears to have been effectual, for he has not returned.

A Form of Regression.

There appears reason to consider that exhibitionism may be in certain cases a regression, and also that a large number of cases are related to a faulty development of the components of the sex instinct, in support of which I would note that in certain of the 150 cases there was an indication that some of the other components were also at fault. Thus a sadistic element appeared probable in a few, the exhibitionist following up his act by an indecent and violent assault on the woman; in one case a masochistic element seemed possible. Two other cases were frotteurs and the exposure was incidental thereto, and two were fetichists, one of whom on arrest was found to have a collection of female undergarments in his pockets.

In the following case exhibitionism, masochism, frottage, and self-flagellation were apparently combined. A business man in fair circumstances, a teetotaller, aged 61, with a grown-up family, lived happily with his wife. He had always been much over-sexed and commenced self-abuse when 11 years old, and continued it from time to time since. He stated that when aged 16 he had indulged in bestiality on three occasions, and in later years from time to time in frottage, purposely seeking crowds for that object. He denied any homosexual tendencies, but had always been much attracted to women. For years he had had the masochistic desire for his wife to hurt him during coitus, and also stated that during the last three or four years he had derived intense sexual excitement periodically by striking his genitals and lower abdomen against bushes which were capable of inflicting scratches upon him. He described in some detail his procedure in which he passed from bush to bush sometimes causing blood to flow. He had a double hernia, and might have excused his offence, as is common, by alleging he was attending to his truss or urinating. He, however, asserted with apparent truth that the exposure was the outcome of the bush flagellation, and this was not inconsistent with the police account of the occurrence; his account was not self-excusatory, he appeared earnest in his desire to become cured, and stated he struggled against his weakness but it overcame him. After its commission he was filled with repugnance and resolutions that it should never occur again. He said he had nearly been detected doing the same thing previously 12 months before. He was quite clear that during this curious performance he experienced no definite pain, and that the lower abdomen as well as the genitalia had to be struck.

Hirschfeld, quoted by Placzek,[5] who disagrees with him, thinks exhibitionism is always a pathological reaction to the fetichistic stimulation of stockings, legs, and other parts of the body. My own experience of these cases leads me to believe such stimulation is quite unnecessary.

Desire for Adventure.

I am myself satisfied that as certain men sally out for the set purpose of indulging in an alcoholic debauch, so others leave home to seek an exhibitionistic adventure. For instance, a recently married man left his office mid-day wearing a long mackintosh and gaiters. He went to a public lavatory and removed his trousers and carried them in an attaché case. He then travelled by conveyance into the next county, where his actions for some hours, although recollected, were undisclosed. On his return in the evening he exposed himself, still with his trousers off, by pulling open his mackintosh to two-attractive looking young women who were the last passengers except himself to get off the conveyance. When arrested, and asked why he had done it, he replied that "he felt like it."

Putnam,[7] in discussing the so-called "insufficiently dressed dreams," says: "Such dreams show what we ought in the interests of human sympathy to recognise, that between ourselves and those whom we stigmatise as exhibitionists, and therefore criminals, the difference, important as it is, is one of degree alone." And I would finally add this also. Medical men engaged in forensic psychiatry will find in these cases particularly the necessity to exercise their judgment as free from disgust as from compassion, lest the interests of the individual on the one hand, and the regard for public self-protection on the other be obscured.

References.

1. J. J. Putnam: Addresses on Psycho-analysis.
2. Krafft-Ebing: Psychopathia Sexualis.
3. Thoinot and Weysse: Medico-Legal Moral Offences.
4. Havelock Ellis: Analysis of the Sexual Impulse.
5. Havelock Ellis: Modesty, Sexual Periodicity, Auto-erotism.
6. Placzek: The Sexual Life of Man.
7. J. J. Putnam: Op. cit.

Reviews and Notices of Books.

GYNÆCOLOGY WITH OBSTETRICS.

A Text-book for Students and Practitioners. By JOHN S. FAIRBAIRN, M.A., B.M., B.Ch. Oxon., F.R.C.P. Lond., F.R.C.S. Eng., Obstetric Physician to St. Thomas's Hospital. London: Humphrey Milford, Oxford University Press. 1924. Pp. 769. 25*s.*

IN this book Dr. Fairbairn has made an honest attempt to weld the twin sciences of obstetrics and gynæcology into one composite whole, and we may say at once that the attempt has succeeded well. The title is perhaps a little misleading in that obstetrics occupies considerably the greater part of the volume; this may be intentional on the part of the author, who desires to include under the term gynæcology everything pertaining to the health of womankind—even obstetrics.

The general arrangement of the book is admirable, and we note with pleasure certain chapter headings unknown to previous text-books; a prologue dealing with the history of obstetrics from the earliest times, the relation of the art to general medicine, and (especially) the new outlook to be acquired in its present-day study. Dr. Fairbairn never forgets the relation which the student of medicine must in due course bear to the State, and his endeavour has been to interest the student in the application of gynæcology to the public weal as well as to private practice. The author believes that the medico-legal and sociological subjects of medicine are more educative to the student if made part of his clinical training. All enlightened teachers will agree with this view. How many a newly-qualified practitioner discovers in the post-graduate school of experience that his portfolio of examination facts is but one asset in dealing with the realities of everyday life and practice.

In the matter of arrangment of contents the reader will receive one or two surprises. For example, puerperal sepsis is discussed under the heading of infections, and is placed between gonorrhœa and tuberculous lesions of the genital tract. Pelvic cellulitis and thrombo-phlebitis of obstetric origin are included in the same chapter. Probably this sequence is logically correct, but it will take time for the mind to divorce itself from its old associations. The same remark applies to such lesions as rupture of the uterus and perineal lacerations. Here true fusion of the twin subjects has occurred, for the reader will find their consideration deferred until the whole subject of genital trauma, including prolapse, is discussed under a chapter devoted to mechanical lesions. It is in matters such as this that the author has made a new departure; the only other combined text-book of obstetrics and gynæcology, that emanating from the Scottish schools of medicine, follows the more established lines of teaching. The reader will be well advised to make a careful study of the general arrangement of Dr. Fairbairn's book before attacking the subject-matter.

The volume is divided into eight parts. Part I. is devoted to normal anatomy and physiology, the chapter on physiology being particularly good. Part II. covers the whole of pregnancy, normal and abnormal. The excellent chapter on abortion includes a section dealing with medico-legal and ethical aspects. In connexion with the toxæmias of pregnancy and eclampsia biochemical problems are considered thoroughly. Perhaps in aiming at the ideal the author has introduced complexities which tend to render a difficult subject more difficult. Dr. Fairbairn is a strong advocate of psychotherapeutic methods in the treatment of hyperemesis gravidarum, and he states that for the last 15 or 20 years every case admitted to St. Thomas's Hospital for excessive vomiting of pregnancy has recovered on these lines without interference with the pregnancy. Part III. covers the well-worn ground of normal and year 1913 in England and Wales 866 men were convicted for indecent exposure, whereas in 12 months 1922–23 only 548 were so convicted. Some such figures were anticipated, and it seems only fair to attribute them as being due, at least to some extent, to the lessened consumption of liquor, bearing in mind the aphrodisiac action of alcohol, and its influence in causing loss of higher control. If liquor was as easily obtainable now as in pre-war times I believe we should find more cases of exhibitionism. When alcohol is associated with the exposure I believe a genuine confusion does in fact at times occur, but I do not think as frequently as is alleged. In some cases a latent tendency towards exhibitionism appears to become manifest under the action of alcohol.

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There appears reason to consider that exhibitionism may be in certain cases a regression, and also that a large number of cases are related to a faulty development of the components of the sex instinct, in support of which I would note that in certain of the 150 cases there was an indication that some of the other components were also at fault. Thus a sadistic element appeared probable in a few, the exhibitionist following up his act by an indecent and violent assault on the woman; in one case a masochistic element seemed possible. Two other cases were frotteurs and the exposure was incidental thereto, and two were fetichists, one of whom on simple handicraft. As long as they are not troublesome they are simply left alone, whereas it is at least possible that the progress of the dementia might be delayed by painstaking occupation therapy.

Dr. Brill, who is responsible for this as for many similar translations, is, in spite of his long experience of the work, still an imperfect English scholar. He cannot shake off the German idiom, and quaint expressions combine with ambiguities to render the reader's task irritating. The following examples occur in the space of a few pages: "Careful oversight of the bladder [in general paralysis] is essential, as otherwise paradoxical incontinences remain concealed." Occasionally the text becomes utterly unintelligible. "In case of any kind of disturbances within the psyche the affects also must function differently than otherwise and may then generate morbid syndromes" (p. 493). "Mistaking an epileptic crepuscular attack of rage for the manic destructive impulse is avoided, among other things, by the absence of distractibility and flight of ideas (but one must not associate the circumstantiality in which the patient is not distractible and does not forget his goal as well as the liability to interruption, with the goal-shifting flight of ideas)" (p. 461). As this sentence stands it is sheer nonsense. There are few people outside a handful of advanced and earnest students of psychiatry to whom this book can be anything more than a work for occasional reference.

GROWTH.

By G. R. DE BEER, B.A., B.Sc., F.L.S., Demonstrator in Zoology and Comparative Anatomy in the University of Oxford. London: Edward Arnold and Co. 1924. Pp. 120. 7*s.* 6*d.*

THE phenomenon of growth is one of the most fascinating and inexplicable in the whole field of biology. The physical development of the individual has exercised the attention of the curious from time immemorial, but we are very little nearer understanding the essential problems concerned in the size of things than were our forbears. That this should be so is scarcely to be wondered at, for, as Mr. de Beer says, growth is a fundamental property of living matter; and life is the riddle of the world. The application of the experimental method has already done something to elucidate the problems, and much greater advances may reasonably be expected in the future. But it is essential that the general biological point of view should not be lost sight of in the specialisation which the subject tends to encourage. Mr. de Beer's book forms an admirable introduction to the study of growth. It is written clearly and simply, technical terms are avoided wherever possible, and the subject is presented from the broadest possible point of view. After a brief introductory chapter the author describes normal growth as exemplified in the frog and in other animals, and in plants. Reproduction, regeneration, and abnormal growths are next dealt with, and then such things as substances which speed up growth, the effect of external conditions on growth, size, rate of growth, differentiation, and age. The treatment of these various aspects of the question is necessarily elementary, but a useful bibliography is appended for the benefit of those who may wish to dig deeper in any particular field. There are several excellent illustrations.

INDUSTRIAL HEALTH.

Edited by G. M. KOBER and E. M. HAYHURST. Philadelphia: P. Blakiston's Son and Co. 1924. Pp. 1181.

THIS is a composite volume, the editors having called for assistance from many contributors, among whom are Italian, German, and English authorities, and, as is usual in composite books, the chapters are of uneven merit and a certain amount of overlapping occurs. The standard of the whole is good, one of the best parts being the prefatory sketch which contains historical retrospects of labour legislation in this country and in America. The sections dealing with carbon monoxide poisoning and caisson disease also deserve special mention for concise writing and up-to-date information; while the comparatively new study of occupational fatigue is clearly set forth by F. S. Lee. The book, however, leaves the impression that the authors are concerned more with the prevention of industrial risks than with the maintenance of health. The great architecture of health as a duty owed by industry to the community seems to be subordinated to consideration of patches and repairs needed to prevent leaks. Hence arises a tendency, manifested by many contributors, to present faulty and unconvincing statistics in proof of a connexion between the occurrence of this or that disease and some occupational influence; this is particularly in evidence on pp. 725–731, where tuberculosis mortality is displayed as a crude proportion of deaths from all causes without reference to age distribution. The short but excellent chapter by G. C. Whipple on statistical fallacies has evidently not been read by all his colleagues.

The arrangement of the subject-matter in the book calls for some remark. At one time particular industries are described—e.g., mining and stonecutting—with dysgenic influences and diseases referred to as incidental matters. This plan has the disadvantage, common to most medical works on occupation, that descriptions of processes appear which carry little meaning for the uninitiated and are unnecessary for the initiated. At another time occupational diseases—e.g., silicosis—are discussed with incidental reference to the several industries and processes in which they occur. This latter plan is more difficult to pursue since each writer needs to have a wide technical knowledge; nevertheless, it is far better calculated to disentangle the knot of cause and effect.

Taken as a whole, the volume merits praise. It is an effort in the direction which, in the editor's words, "results in the health and efficiency of employees being promoted, the profits of the manufacturer increased, and the quality of the products improved." It will remain for long as a work of reference.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVII., No. 3. Pp. 217–348. July, 1924.—The Value of Naphthalene Emulsion in the Treatment of Experimental Intestinal Tuberculosis, by A. Stanley Griffith (Cambridge). The author has repeated Redman's experiments in a slightly modified form and has failed to obtain any evidence that naphthalene is of value.—In the next paper T. Redman (Liverpool) criticises Griffith's procedure and brings forward fresh experiments which, though not so striking as his original series, support his contention that naphthalene given by the mouth has a curative effect on infected guinea-pigs.—Blood Agglutination Tests on Fowls for Bacillary White Diarrhœa, by Edith Knight (London). Infected fowls can be identified by agglutination tests with *B. pullorum* and eliminated from the breeding stock with favourable effects on the occurrence of white diarrhœa in the young chickens.—The Formation of a Cancer-producing Substance from Isoprene, by E. L. Kennaway (London). Many attempts have failed to identify the substance or substances in tar which are active in producing epitheliomata in mice. The problem is simplified by using tar made by overheating isoprene, which excludes all bodies containing nitrogen; this tar is quite active.—Anæmia in Hens Associated with an Increase of Yellow Fat Pigment, by S. P. Bedson and Edith Knight (London). A description of a rare condition, possibly related to fowl leukæmia, which in a proportion of experiments is transmissible by inoculation.—The Nucleated Red Cells Found in the Blood in Pernicious Anæmia, by A. Piney (London). The real megaloblast has a characteristic structure and is found only in pernicious anæmia; it has been confused with the abnormal labour in a manner both interesting and convincing. Diagnosis and management are considered in the light of recent advances of knowledge, and the more purely academic problems of mechanism receive adequate but not undue emphasis. The rotations of the presenting part are well shown in a series of diagrams which would be useful for demonstration. Part IV., under the heading of "Lying-in Period," contains chapters upon the management of the new-born infant with a wealth of material and sound sense. Parts VI. and VII. are devoted to those subjects generally included under the term gynæcology, and the author has followed in general Prof. W. E. Fothergill's arrangement of diseases. It is in these sections of the volume that the reader will find the process we have called welding most developed. The inclusion of such subjects as puerperal sepsis and puerperal tears has already been noted. Similarly, Part VII. covers both obstetrical and gynæcological operations.

The author throughout has limited descriptions of instruments and operative procedures to such essential points as are necessary for an understanding of the methods of investigation and treatment, the details being left to be acquired in the only way possible—viz., by assisting in the operating theatre or labour ward, or by practising on the model. Much pathological detail usually introduced into text-books is omitted; the author defends his action on the ground that pathology has its own place in the curriculum, its own teachers, examiners, and examinations. Exception may be taken to this assertion in schools at which general pathology does not include the special pathology of the pelvic organs—e.g., endometritis, overgrowth of the endometrium in relation with the menstrual cycle, and such lesions as are included under the comprehensive term "chronic metritis." But the author's omission is logical. The concluding section of the volume is devoted to public health, social and ethical aspects.

Dr. Fairbairn has written a notable volume, valuable alike for its originality and breadth of outlook, a book which cannot fail to leave its impress upon current obstetric teaching, and which attains its object in presenting to student and practitioner modern views upon what the author would have us consider, not twin sciences, but one science.

A Memoir of William and John Hunter.

By George C. Peachey. Printed for the Author by William Brendon and Son, Ltd., Plymouth. 1924. Pp. 313.

The lives of the two Hunters will be ever of interest not only to members of the medical profession, but also to all those who enjoy a record of laborious search into the secrets of Nature, not for personal objectives, but with the desire to benefit humanity. Mr. Peachey prefaces his memoir of the brothers with an interesting account of the early teaching of anatomy in England down to the year 1746, in which year William Hunter began his first course of anatomical lectures, the advertisement of which (for there were no medico-ethical committees in those days) appeared in the London *Evening Post* of Sept. 16th, 1746. On this point Mr. Peachey has been able to correct a statement of former biographers that William Hunter's first essay at lecturing in London was made before the Society of Naval Surgeons, for that society was not founded until January, 1746–47, the first lecture being delivered on March 20th, 1746–47; as the year then began at Lady Day, William Hunter's lecture in September, 1746, was delivered some four months before the Society came into existence.

It may or may not be true to say "Great wits to madness sure are oft allied," but it is true that men of genius are often irritable, and the Hunter brothers were no exception, a fact which Mr. Peachey does not strive to conceal. They quarrelled with each other and both of them with their professional brethren, John being especially difficult. Early in his career we find him writing from Belle Isle, whither he had gone as surgeon to the expedition under Keppel in 1761, "My fellow creatures of the Hospital are a damned disagreeable set," and the whole unhappy contest with his colleagues at St. George's is set out in full in Appendix IV. of Mr. Peachey's book. No doubt Hunter was wrong in the manner in which he carried on the controversy, but the base motives imputed to him by his colleagues were certainly not in his mind.

There is one phrase in the book which needs explanation, at least for the general English reader. A note on p. 55, referring to William Hunter's career at Glasgow University, runs: "Mather adds that it was a bajan bursary of the value of £10 annually for four years." The word "bajan" is a variant of the French word *béjaune*—i.e., *bec jaune*—meaning a young bird, and was the title applied in a mediæval university to a freshman. The only blemish in the book is that there is hardly any account of the Hunters' parentage, but on the whole the memoir is well done and there is an excellent index.

Text-book of Psychiatry.

By Prof. Dr. Eugen Bleuler, Director of the Psychiatric Clinic, Zurich. Authorised translation by A. A. Brill, Ph.B., M.D. London: George Allen and Unwin, Ltd. 1924. Pp. 635. 25*s*.

This handsome volume is by no means a redundant addition to English psychiatric literature. In its arrangement and outlook it materially differs from works by English authors, and many new points of view, suggested or implied in its pages, may have a stimulating effect on minds accustomed to different teaching. The analytical point of view is constantly present throughout this book; but far from making extravagant claims for psycho-analysis as a method of treatment, he makes very little direct reference to it. This is an important omission; a modern text-book of such size and origin may rightly be expected to devote a chapter to this form of treatment, its indications, limitations, and dangers. Another unexpected feature is the inadequate treatment of toxæmia as a causal factor in insanity. No mention is made of focal infections, and puerperal psychoses are classed as schizophrenia. Evidence has fast been accumulating that infection plays an important part in certain forms of insanity, and even if Dr. Bleuler does not credit this evidence, in such a book as this he should at least state the case therefor. The physical accompaniments of mental disorder receive somewhat scant attention throughout the book, and the reader feels that its author is more a psychologist than a physician.

The greater part of the book naturally is devoted to the description of disordered mental states, and the immense volume of information comprised in these accounts constitutes its chief value. Numerous examples are quoted at length, and details are found here and there which must be new even to practising alienists. Perhaps the most notable of these accounts is that devoted to alcoholic psychoses, which extends over 50 large pages; the author, by the way, does not regard delirium tremens as a symptom of alcohol deprivation. A departure from the classification commonly accepted in this country lies in distinguishing ten varieties of insanity, including paranoia, folie à deux, and a number of others less familiar and not universally recognised as distinct types, under the heading of "Psychopathic Forms of Reaction (Situation Psychoses)." An important novelty on the practical side is the suggestion that cases of dementia præcox should only be given institutional treatment when there are special indications for it, such as violence or suicidal tendencies; the first essential is occupation, and this can better be provided at home. Such an arrangement might present great difficulties; on the other hand, attendants in institutions are often unable to devote the time required for teaching these patients some

THE LANCET.

LONDON: SATURDAY, AUGUST 23, 1924.

THE STATE OF PUBLIC HEALTH.

The Annual Report of the Chief Medical Officer to the Ministry of Health for the year 1923 is published this week, and contains the official records and statistics which are required from time to time in order to estimate the state of public health. It includes special references to particular diseases, and deals in general terms with the central actions which are being taken in regard to their prevention and the sanitary protection of the country. There is reference, often in considerable detail, to maternity and infant welfare services, insurance medical service, and the medical work undertaken in connexion with the Poor-law, while considerations of general sanitation include a special section on the relations of food to health and disease. The Minister of Health is charged with the task of supervising the administration by the sanitary authorities of the law dealing with food-supply, and the investigations in particular of the milk-supply of the country should have a valuable influence on public health and statistical records, and are accordingly given prominence in the Report.

The story which Sir George Newman has to tell is, on the whole, a cheerful one, and it need hardly be added that it is told effectively. The decline in the birth-rate is not so marked in 1923 as it was in 1922, but it is there to remind us that our total of population may be too much dependent upon reinforcement at the wrong end. The total death-rate is the lowest ever reported in the country, and there is a real triumph of preventive medicine behind an infant mortality-rate of 69. The number of cases of epidemic and infectious disease also compares favourably with the corresponding number in the report for 1922—namely, 344,183, against 422,949—but we are warned that, while facts and figures unite in giving us a promising record, unduly optimistic conclusions may easily be drawn. In any one year, for example, a particularly low mortality may depend on meteorological conditions or to a freedom from widespread epidemics whose absence from our shores cannot fairly be attributed in any large measure to national precautions. It is not a good thing to regard progress up to a certain point as an accomplished fact, for confidence in past performances may lead to a turning of the blind eye upon situations which, with due attention, could be further improved. The way to read the Report is as an interim document, which states what has occurred with reference to what should occur if the recorded efforts, successful up to certain levels, are persevered in and coördinated. If we consider the eighth section of the Report, for instance, which deals with the Poor-law Medical Service, we shall see at once how much work, both at the centre and periphery, remains to be done before a standard and pattern of administration and performance can be arrived at which will serve the general needs of the country. The section starts with the admission that year by year the problems of the Poor-law authorities have assumed greater importance, yet in regard both to domiciliary and institutional treatment the arrangements are sadly in need of overhauling, and the evidence of this need is very clearly exposed. For the provision of domiciliary treatment the guardians divide the areas for which they are responsible into a definite number of medical relief districts, and to each of these a district medical officer is appointed, being as a rule a part-time officer, though certain populous districts occupy the whole attention of a salaried officer. But the range of service expected from district medical officers has never been strictly defined, and the schemes made by Poor-law authorities for institutional treatment vary in different parts of the country in accordance with the size and needs of the areas, being influenced also by the extent to which in any given district the old intent to provide for all the needs of the destitute, non-medical and medical, has been replaced by organisation for the treatment of the sick. In all Poor-law areas institutional treatment is now provided either by the provision of separate infirmaries or by the allotment of definite wings of the workhouse to the treatment of the sick, and the accommodation which is thus forthcoming is capricious, being very much better in some places than in others. But undoubtedly the movement for conducting the Poor-law infirmary on lines comparable to those which mark the general hospital is growing in strength, and it is to be hoped that difficulties of organisation will not always prevent medical students from availing themselves of the facilities offered by the infirmaries for clinical instruction. But it will bring with it a further complication in respect of the position, voluntary or otherwise, of the medical staff of Poor-law institutions, and here we find every conceivable variety of arrangement. The smaller infirmaries are in the medical charge of practitioners engaged in general practice, save where the whole-time medical officer may combine the supervision of the institution with other public medical appointments. In institutions of medium size there may or may not be a resident medical superintendent, but in an increasing number of institutions the whole-time medical staff is supplemented by consultants employed under various conditions, and to differing extents, so that in large infirmaries the medical staff may include a medical superintendent, a group of assistant medical officers, and a full complement of consulting specialists. The number of professional and administrative problems suggested is, it will be seen, a large one, and only steady work in accordance with well-devised plans can deal with them effectively. Urgent as the position is, hasty action to meet a detail should not be asked for, unless it is clear that the course demanded would not embarrass a general policy.

To summarise what is itself a summary, and in places a summary of summaries, would result in nothing, and all medical men should read this Report, the general conclusions of which will be found on page 401. They will see that its essential message is the necessity (to use Sir George Newman's words) for concentration on the strongholds of disease, careful macronormoblast which occurs in other anæmic conditions.—The Control of the Virulence of the Pneumococcus, by J. F. Gaskell (Cambridge). The author recommends the use of solid egg media and broth made after the recipe of E. G. Murray, with occasional passages through mice.—The Modification of Diphtheria Toxin by Formaldehyde, by A. T. Glenny, Barbara E. Hopkins, and C. G. Pope. Toxin treated by formalin is relatively non-toxic, but retains high antigenic and immunising properties.—Changes in the Culture Medium During the Growth of *B. diphtheriæ*, by A. F. Watson and U. Wallace (London). The growth of both toxigenic and non-toxigenic strains in broth leads to an increase in the nitrogen precipitable by acetic acid and in the amino-nitrogen; the former fraction is closely associated with the toxin, if any.—The Concentration of Diphtheria Toxin, by A. F. Watson and U. Wallace. By precipitation by acetic acid toxin may be concentrated up to a hundred times or more and largely freed from extraneous matter.—The Pathology of Oxalate Nephritis, by J. S. Dunn, A. Haworth, and Nora A. Jones (Manchester). The intravenous administration of sodium oxalate to rabbits leads to a subacute catarrh of the first convoluted tubules with small doses; with larger doses to necrosis of the same cells with stasis and hæmorrhage in the glomeruli.—The Microcapillaries in the Liver and Bile-ducts, by G. S. Williamson and Innes H. Pearse (London). The epithelium of the gall-bladder and bile-ducts has an intracellular system of canaliculi similar to that described by the authors in the thyroid and continuous with the same arrangement in the liver parenchyma.—The Experimental Study of Gastrotoxic Serum, by J. Koopman (The Hague). The author could not obtain Miyagawa's results with auto- and iso-gastrolysins.—The Acid-fastness of the Tubercle Bacillus, by C. H. Browning and R. Gulbransen (Glasgow). The substance on which acid-fastness depends is very readily soluble in lipoid solvents which are acid.—The Parasites of Spontaneous Encephalitis in Rabbits, by G. C. Cameron and H. B. Maitland (Toronto) and C. Da Fano (London). In the experimental investigation of a case of encephalomyelitis by rabbit inoculation, the authors ran into a transmissible encephalitis of the rabbit with characteristic sporozoon-like parasites in the brain.—Agglutinins for Pfeiffer's Bacillus in Influenza and Other Diseases, by W. J. Wilson, J. H. Dunn, and E. M. McV. Blair (Belfast). Cases of influenza nearly always agglutinate Pfeiffer's bacillus; great care must be taken to use an agglutinable emulsion. Controls are negative except a few patients mostly with pulmonary affections.—The Dick Reaction in Scarlet Fever, by C. C. Okell and E. M. Baxter (London). Filtrates of hæmolytic streptococci from scarlet fever work like diphtheria toxin in the Schick reaction.—The Reaction of the Skin to Vaccinia Virus, by J. C. G. Ledingham (London). The response to vaccinia virus is primarily vascular, involving the endothelium of the vessels and their sheaths. The involvement of the epidermis is always secondary and there is no reason to include vaccinia in the epidermotropic infections.—Observations on the Effect of Diet on the Inflammatory Reaction, by J. A. Arkwright and S. S. Zilva (London). Guinea-pigs which are underfed, quantitatively or qualitatively, give much smaller inflammatory skin reactions to diphtheria toxin and other irritants than normal animals.—The Pentose Metabolism of Spontaneous Mouse Tumours, by B. R. G. Russell (London). Tumours seem to differ from normal tissues in their capacity to use xylose, and spontaneous do not differ from transplanted tumours in this respect.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains the following articles: Achlorhydria and Hydrochloric Acid Therapy in Addison's (Pernicious) Anæmia, by Maurice E. Shaw. Investigations on the gastric secretion were carried out in seven cases of Addison's anæmia. It was found that achlorhydria was invariably present, and that its amount could be measured. About 2 drachms of acid. hydrochlor. dil. (B.P.) were required to supply the defect, and, if given by the "continuous" method, germicidal activity was restored to the gastric secretion.—Auricular Fibrillation in Thyro-toxic Conditions, by T. P. Dunhill, F. R. Fraser, and A. W. Stott. The authors record a series of 15 cases of thyro-toxic conditions associated with auricular fibrillation. Valvular disease was not present in any instance. They conclude that auricular fibrillation may at times have a thyro-toxic cause. In some of these cases a stable sinus rhythm followed partial thyroidectomy, and in others, in which fibrillation persisted after operation, normal rhythm was restored by the administration of quinidine. A series of electrocardiograms is included.—A Study of the Metabolism in the Under-nourished Infant, by G. B. Fleming and H. S. Hutchison. Metabolic observations were made upon infants admitted to hospital in various degrees of malnutrition. In the absence of gastro-intestinal disturbance no defect was found in the absorption of food, but it was not possible to estimate the absorption of carbohydrates. The utilisation of food also appeared normal in marasmus. Deficiency in quantity in diet is often the causative factor apart from gastro-intestinal disturbances, but in some cases marasmus occurs although neither of these factors is present.—Congenital Pancreatic Disease with Infantilism, by Cecil Clarke and Geoffrey Hadfield. The case recorded is that of a girl, aged just over 4 years, who died from broncho-pneumonia. She had suffered from fatty diarrhœa since she was 5 months old, and her appearance was that of a child 2 years of age. Post mortem, the pancreas consisted of a mass of fat containing a thin strand of gland tissue. Two plates are included illustrating the changes in the pancreas.—Tularæmia in Man from Laboratory Infections, by J. C. G. Ledingham and F. R. Fraser. Generalised infection with the *Bacterium tularense* causes a disease in rodents resembling plague, and man may be infected. It is confined to North America. Three laboratory workers of the Lister Institute, who were investigating the organism, became infected. The clinical condition of two of these cases is given in detail. An account is also included of serological tests for the recognition of the disease, and of the histological nature of the lesions in infected guinea-pigs and mice. These are well illustrated by two plates.—On Progressive Lenticular Degeneration (Hepato-lenticular Degeneration), by J. G. Greenfield, F. J. Poynton, and F. M. R. Walshe. The article opens with an historical and clinical account of the disease, which was first described by Wilson in 1912. A full record follows of the case of a girl of 15 who was under observation for some time until her death. Post mortem, the liver showed atrophic multilobular cirrhosis, and in the brain the corpus striatum was shrunken. Microscopically, the putamen and caudate nucleus were chiefly affected, and degeneration of nerve tracts in relationship to these bodies was seen. Corneal pigmentation due to granules in Descemet's membrane was also present. The article is illustrated by four plates, which show the clinical aspect of the patient and the morbid anatomy of the liver and brain.—Disturbance of the Acid-base Equilibrium of the Blood to the Alkaline Side: Alkalæmia, by Arthur W. M. Ellis. After an introductory account of the processes involved in neutrality regulation four cases of alkalæmia are described. In two of these large doses of sodium bicarbonate had been administered, and in the others there was intestinal obstruction high up. The urine in alkalæmia may be acid and contain ketone bodies. The most striking clinical manifestation is tetany, and it is probable that gastric tetany is of this nature and associated with a reduction of the plasma chlorides. The author suggests that the ketonuria of alkalæmia is due to anoxæmia, and that the latter is responsible for the symptoms which are characteristic of the condition. Clinically, the administration of 2 per cent. ammonium chloride solution per rectum has met with success.

EARLY MENTAL DISEASE: THE NEED FOR CLEAR THINKING.

IN making plans, however Utopian, for the better treatment of early insanity, it is well that we should understand for what precise forms of mental disorder the provisions are intended. It was observed by Dr. HENRY YELLOWLEES, in a discussion at Bradford which is reported elsewhere in this issue, that the "early" cases, for whose treatment there is at present so little satisfactory provision, are of several types entirely distinct both in aspect and prognosis. Of the adjectives distinguishing these types, by far the most inclusive is the term "incipient," which may indeed be applied to any form of insanity whatever, at the stage which the word denotes. Such a case, and those which may be described by the equally ambiguous epithet "mild," are not by any means necessarily curable, and Dr. YELLOWLEES evidently fears that the use of these terms may lead the public to expect recoveries which in many instances are exceedingly unlikely to follow, even from the provision of new institutions for early treatment. The true borderland case, on the other hand, does not become insane at all. This expression denotes a degree of mental disturbance insufficient to justify certification, non-progressive, and amenable, as a rule, to some form of treatment. Is there any criterion, such as the existence of delusions, which can be said to distinguish absolutely between mere depression and melancholia? Dr. G. W. B. JAMES, in the same discussion, raised a question of the greatest difficulty with which this is connected. He answered it by saying that he "believed it impossible, as a general rule, to certify a patient who intended to commit suicide unless there was other evidence of mental disorder." With this serious and unfortunate conclusion the majority of alienists will agree. Although deliberate suicidal intention is almost always associated with a grossly perverted outlook and sense of values; these cannot be said to constitute legal insanity, and the mere fact that suicide itself may in some circumstances be a sane act in the opinion of many people is, perhaps, a sufficient answer to this question.

Another point made by Dr. YELLOWLEES, which has an important bearing on the provision of early treatment, and on the attitude of the public towards it, is that acute, recent, recoverable cases are often much more abnormal in conduct than the chronic and hopeless insane. It is his experience that the public is being misled on certain of these points. It may safely be assumed that a proper comprehension of all the complex issues involved is a rarity even among the educated classes, and if by any avoidable means their conception of these issues is being perverted, it is certainly regrettable. There is no aspect of medical work in which public confidence and coöperation could be more useful, and none in which at present they are more difficult to obtain. Fully half the difficulties of lunacy administration depend in some way on public ignorance; many of the tragedies reported from the courts might have been averted if normal individuals had recognised in time that someone was of unsound mind, and had taken the necessary steps for his care. The daily press will have an opportunity, in reporting faithfully the proceedings of the Royal Commission on Lunacy Administration, of remedying to some extent the ignorance upon which so many of these difficulties depend.

ON SUTURES.

THE problem of suture materials is one which has taxed surgeons from very early times. Since AMBROISE PARÉ startled his scientific world by daring to ligate a blood-vessel, surgeons have continuously sought a material which would do what they require without introducing some element of secondary difficulty. In a septic wound to introduce a foreign body is to invite trouble, and even where the most scrupulous asepsis can be maintained it has always been evident that to leave unabsorbable material in a wound is a defect, however necessary, in surgical technique. With the introduction of catgut it was thought that the problem had at last been solved, but it was soon found that the difficulty of controlling the rate of absorption was considerable. However carefully catgut may be prepared, individual variations in absorptive power are enormous, and the "40 day" label in which the surgeon confides is a very rough index, considering the variation in rapidity of absorption in the muscles, the peritoneum, or the stomach, in the child and in the man, quite apart from anomalies in the catgut itself. Silk will certainly remain in the tissues, but surgeons have found to their cost that it may frequently gather to its folds seven other devils worse than itself in the shape of chance bacteria, and the end of that patient may be worse than the first. An ingenious compromise was suggested last week by Mr. D. MCINTYRE, whereby a fine filament of silk is embedded in a strand of catgut. The catgut is absorbed, and the fine silk appears to give rise to no trouble. The larger suture is easier to handle than fine silk, and has not the same tendency to cut through the tissues at operation. For, apart from the duration of suture materials, we have to consider the endurance of the material sutured, and it is to be feared that we often forget how slight this is. Generally speaking, there is no known means by which two portions of soft living tissue can be kept together artificially for more than 10 days. If union has not occurred within that time, the sutures cut through and the tissues fall apart. Indeed, in many cases five or six days is the longest period for which reliance can be placed upon sutures, not because they are absorbed, but because the material sutured disappears. It is said that certain materials such as kangaroo tendon and silk impregnated with mercury are not absorbed, but are invaded by living tissue cells and practically become embodied in the tissues. Were this the invariable result of their introduction the surgeon would have attained his ideal, but unfortunately it is not always the case. It is well, however, that we should recognise that the only permanent suture, if it is ever discovered, will be one that is gradually embodied in the living tissues, and that unless this condition is satisfied, no suture, whatever its durability, can hold soft tissues together for more than a few days.

THE Wellcome Historical Medical Museum at 54A, Wigmore-street, London, W., will be closed for cleaning and redecoration from Sept. 1st to 30th inclusive.

THE NIGHTINGALE TRAINING SCHOOL FOR NURSES, ST. THOMAS'S HOSPITAL.—In view of the ever-increasing scope of nursing work, the Nightingale Fund Committee has established a Traveller Fellowship, the holder of which is to visit Canada and the United States to examine and inquire into nursing, especially in relation to public health, and to report. It is felt by the committee that this experiment is quite in keeping with the pioneer spirit of the lady whose name the Fund bears. Miss Olive Baggallay has been appointed first Nightingale Travelling Fellow.

coördination and direction of means to ends, and systematic research. He prefaces this programme by laying stress on the need for the education of the people in hygiene. This education, we think, is now really progressing. In many directions where lay bodies are in charge of our local government there is an increased appreciation of the services of medicine, and a quicker perception both of what the prevention of disease means and of how the public can coöperate in it. The many publications dealing with questions of public health and medical service which have been issued at popular prices by the Ministry of Health for the last four years have played a great part in the instruction of all sanitary authorities, and the task of medical men has been lightened by finding that the community is not only willing to be guided but can be appealed to, when certain courses have to be taken, as reasonable participants in the work.

RHEUMATIC AFFECTIONS OF THE HEART IN CHILDREN.

The Ministry of Health stated recently that rheumatism costs approved societies each year something like £2,000,000 in sick benefit and is responsible for a loss to the nation of at least 3,000,000 weeks of individual work. Dr. Carey Coombs, who has done special research work on the subject, found that in Bristol 80 persons died every year of rheumatic heart disease, death occurring at an average age of about 35, preceded by five to ten years partial or complete incapacity for work, so that in any given year Bristol, with a population of 370,000, was maintaining about 500 persons incapacitated by this form of trouble. The average age of onset in two-thirds of a series of from 600 to 700 cases was between the tenth and fifteenth year. That these cases should be dealt with when the first manifestations show themselves is obvious, and it is encouraging to note the increased attention which is now being paid in many parts of the country to the treatment of this condition. In The Lancet of June 28th we drew attention to the excellent work which the Invalid Children's Aid Association is doing amongst children in the treatment of rheumatic affections of the heart. In 1918 the Association established the Edgar Lee Home at Stonebridge Park, and three months ago opened a similar home—Kurandai—at Hartfield, Sussex, for 50 children. The board of management at Great Ormond-street Hospital, London, have also taken a significant step in establishing a research department in which it is proposed among other things to investigate the phases of infantile rheumatism. At St. Thomas's Hospital also important clinical observations are being made on this condition, while in the provinces Birmingham and Bristol are tackling the question of heart disease in children in a practical manner. Dr. G. A. Auden, the school medical officer for Birmingham, reports that a society for the care of invalid children, especially those suffering from rheumatism, chorea, and heart disease, has been formed in that city. Ten beds are reserved in the cottage hospital of Much Wenlock for such cases, and over 40 other cases requiring prolonged treatment have been dealt with. An investigation into the after-history of 74 Birmingham children who had suffered from chorea showed that: (1) Out-patient treatment gave unsatisfactory results. (2) Home treatment was also unsatisfactory except in rare cases. (3) In-patient hospital treatment with prolonged stay gave good immediate results, but relapse was noticed in several cases shortly after the ordinary routine of life was resumed. (4) Short periods in the country, or one month in convalescent homes, gave ineffectual improvement with frequent subsequent relapse. (5) Where prolonged rest and open-air treatment were obtainable, the results had been very encouraging; a severe case resulted in a complete cure in four months, and so far there had been no relapse. The results altogether show that prolonged rest and open-air treatment give the best results, provided that the return to conditions of ordinary life is very gradual, with limited mental and physical strain.

In Bristol a number of typical cases of heart disease were investigated during the past year with a view to ascertaining to what extent proper provision is made for the treatment of the disease. These children were examined by one of the honorary staff attached to the city hospitals. It was found first that the child could not be kept in hospital nearly long enough for the heart to recover completely; secondly, that there were in the schools a number of cases which should be, but were not receiving any treatment whatsoever; with the result that in many cases lesions which might have been cured or greatly ameliorated were converted into serious and permanent disorders. The difficulty of providing hospital accommodation for such cases has been temporarily lightened by the offer of the Bristol Crippled Children's Society to provide the cost of dealing with a few cases for the next six months. There is no doubt that the question Birmingham and Bristol are now tackling is of primary importance in school hygiene. Treatment of defects follows so easily and readily these days upon their finding, thanks to the efficiency of the School Medical Service, that prevention of defect has become the centre round which all effort must circulate. The prevention of rheumatism and the treatment of its effect are in the forefront of points pressing for consideration in school hygiene. Special beds, with special medical supervision, are required for treatment, in addition to trained observations of a pathological condition about which in actual fact we know little enough. Much will result from attention focused on this subject provided adequate financial support is forthcoming. The problem is therefore clearly one for the education authorities to handle. As the school medical officer for Bristol, Dr. R. A. Askins points out, a disease which is more common than tuberculosis and is accountable for many more deaths and disabilities is one which ought to be tackled scientifically and thoroughly, and yet it is the one most commonly neglected, and it is to be hoped that other authorities will also take up this all important and pressing question of the treatment of heart disease among children of school age.

Dr. Carey Coombs suggests: (1) A clinic in which children with cardiac disorders may be inspected with a view to determining whether any special treatment is needed; (2) a school hospital where children with heart disease of moderate severity can be simultaneously educated and treated for periods of several months at a time; (3) it is desirable that long periods of rest in hospital should be available for children with severe cardiac rheumatism. We should like to add that any such institution should be under a constant medical supervision, for it is only by this means that the effects of regulated rest and exercise which are the essentials of such treatment can be scientifically noted and the treatment rendered effective.

signs on examination of the chest were those often observed in typhoid fever. There were sibilant râles distributed in a patchy manner over the lungs, without showing any special predilection for the bases or apices. The percussion note was not appreciably affected, the cough was moderate, and the expectoration slight. With tubercle bacilli found in the sputum and negative bacteriological and serological tests for typhoid fever, there could be no doubt as to the diagnosis which, in four cases, was confirmed by an X ray examination. Dr. Pellé notes that tuberculosis of the lymphatic glands and of the bones and joints may also make its debutant appearance under the guise of typhoid fever, and he records one case in which either typhoid or paratyphoid fever was diagnosed on three occasions within nine years, the disease not being recognised as tuberculosis of the hip till much valuable time had been lost. With regard to the coincidence of typhoid and tuberculosis, the author confirms the observation of Prof. Léon Bernard that the two diseases are seldom observed in the same patient. And when they are, the typhoid fever does not apparently stir the tuberculosis into renewed activity; in the only two cases in which Dr. Pellé has observed this combination there was no exacerbation of the tuberculosis, and as the Pirquet reaction to tuberculin remained positive after the onset of the typhoid fever, it may be assumed that typhoid fever differs in this respect from measles which often converts a positive into a negative Pirquet, at the same time as the tuberculosis shows clinical signs of rapid progress. The dietetic restrictions imposed on typhoid patients may not be fashionable a few years hence, but, as long as they are, mistaking tuberculosis for typhoid fever is calculated to inflict serious injury on a patient, one of whose first needs is plenty of nourishing food.

FACTORY HYGIENE IN 1923.

The Chief Inspector's report[1] gains additional interest this year owing to the existence of a Bill proposing to consolidate factory legislation passed since 1901, the date of the last consolidating Act. Developing industries create new hygienic problems. Dr. T. M. Legge contributes a chapter in which he records some rise in reported cases of plumbism, largely due to an increased call for electric accumulators set up by the advent of broadcasting, and to burning off paint in the developing industry of ship-breaking. Other unusual poisonings were due to arseniuretted hydrogen generated by the chance action of rain-water on refining dross, and to inhaling fumes of cadmium given off in carelessly melting ingots of this metal. Investigation by Dr. S. A. Henry of scrotal cancer among mule-spinners in Lancashire brought to light 145 cases ascribed to contact with shale oil and American oil. One of these was recently the occasion of a test case for compensation in a county court, and, as a correspondent points out on p. 408, the judge's ruling, if it stands, is likely to bring effective pressure on other employers to remove such risks for their workpeople. Dr. E. L. Middleton has continued his investigations on silica dust and reports danger from re-entry into workplaces of effluent currents discharged from exhaust draughts planned to remove dust as generated. Reference is also made to the first cases of poisoning from manganese dust recognised in this country; fortunately, the risk can be controlled, for seriously poisoned men are long-lived cripples. Perusal of the reports as a whole leaves the impression that the activities of the inspectorial staff are mainly devoted to preventing accidents by safeguarding machinery. Yet records are given to prove that "safety first" provides a far more effective method of prevention: thus, instances are quoted where safety first in one case progressively reduced a frequency rate from 32·3 in 1920, to 25·9 in 1922 and 23·6 in 1923, and in another a percentage of 9·4 in 1918 fell to 4·8 in 1922 and 4·0 in 1923. Meanwhile, the sum of reported accidents for 1923 has risen to a total of 125,551, being an increase of 27,565 over the total for 1922. This tendency to concentrate on the mechanical side of accident prevention no doubt results from employing engineers to administer the Acts, and from collecting statistics of accident occurrence to the exclusion of information as to the far greater amount of lost time resulting from sickness directly arising from occupational environment. Much more than half the report deals with accidents; less than four pages are devoted to overcrowding, temperature, lighting, and dust extraction, while welfare, statutory and voluntary, comes off little better with eight. The time of the existing medical staff is taken up with the occurrence of diseases peculiar to industry, such as anthrax, poisoning by lead, arsenic, mercury, benzol, aniline, and other chemicals, gassing and skin affections, which, when all are added together, cannot make up more than a fraction of the amount of sickness due to, say, rheumatism of occupational origin. Industrial diseases in their day have served a useful purpose, the purpose of paving the way for occupational hygiene. Dr. Legge's report contains an analysis of the 300,814 certificates of fitness issued during the year and the medical reasons for the 1·96 per cent. of complete and 4·37 per cent. of conditional rejections. Otherwise there is no mention in the report of occupational hygiene, although a number of progressive firms have already established highly successful medical services, and the Bill before the House provides means by which such service can supplement or replace that of the certifying surgeon. As small workshops decline in number (from 145,684 in 1922 to 140,850 in 1923) and larger factories increase (from 137,858 to 139,920) facilities for such service are rapidly growing. The Factory Acts are an essential part of our public health code, and the department which administers them is carrying on public health work, yet its staff of over 200 (trained as engineers, chemists, and the like) is only leavened by five with medical qualifications. Little wonder that the average employer who never sees a medical inspector fails to appreciate the value to his workers and, through them, to himself of occupational hygiene.

THE OUT-PATIENT OFFICER'S "AT HOME."

The first definition given to the word hospital in a well-known dictionary is "a place of shelter or entertainment," and in many respects that old meaning is much truer to-day of our modern hospitals than might be supposed, for the poor find there shelter, while the physician, particularly the out-patient physician, finds in the tragedy that is ever being unrolled before his eyes an element of comedy that is infinitely relieving in the sad environment. On this aspect of affairs at the Westminster Hospital Dr. Adolphe Abrahams contributes a graphic essay to a recent issue of the *English Review*. The hospital, he says, is an institution in every sense of the word. "The poor have not hospitals, they have 'their hospital,' their traditional family hospital. The medical officers change, but the institution and its tradition go on. Not only does the hospital minister to the sick, it does much more—it supplies some break in the monotony of narrow sordid lives, something to which to look forward. For one day in every fortnight at the out-patient physician's 'At Home' there is the opportunity afforded for a touch with sympathy, with refinement, with education, one might almost say, with decency." And the physician must possess all the qualities of the perfect host. "He must be all things to all men, and more particularly to all women. For they will come to him to discuss not merely their physical disabilities, but all the details of their lives and those of their relatives and acquaintances, to ventilate their grievances, to receive congratulations on their joys, to extract sympathy for their sorrows. He must express no surprise that Mrs. Riley's spectacles are optically unsatisfactory because she shares them with her

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[1] Annual Report of the Chief Inspector of Factories and Workshops for 1923. H.M. Stationery Office. 1924. Pp. 129. 3s.

Annotations.

"Ne quid nimis."

COMPARATIVE ANÆSTHETICS.

There are one or two striking differences between the practice of anæsthetics in the United States and Canada and the arrangements with which we are familiar in this country. These differences are shown in the paper which we publish at page 411, and their effect on the administration of anæsthetics and on the progress of the art of anæsthesia is worthy of comment. It must be remembered first of all that just as conditions here vary, to a certain extent, in different parts of the country, and even in different hospitals in the same town, so in a vast country like America widely different customs prevail in the practice of localities which are thousands of miles apart. Consequently when, for purposes of argument or comparison, forms of practice are selected, it must be borne in mind that these particular forms of practice, although the routine in one city or one hospital, may be entirely absent from many other centres of medical education. In considering the practice of anæsthetics on the other side of the Atlantic the anomaly appears that conditions exist which invest anæsthesia with more importance than with us, while other conditions exist which suggest exactly the opposite. The latter are represented by the employment of nurses, and the former by a supply of whole-time paid anæsthetists, which is only faintly paralleled in Great Britain by our resident anæsthetists. For the employment of nurse-anæsthetists we can find no valid argument. However perfectly she may carry out the strictly limited task assigned to her, the nurse-anæsthetist cannot give to the surgeon the same security which he derives from a competent anæsthetist, who is also an experienced medical man. And as regards advancing the practice of anæsthetics, her opportunities or abilities are equally negligible. The paid whole-time anæsthetist presents a different problem. From the point of view of the institution which he serves, an adequate supply of whole-time anæsthetists presents the ideal condition. This is attained, we may assume, when every anæsthetic in the hospital, routine or emergency, is administered by an expert. This ideal of hospital practice, however, would entail serious educational drawbacks, and it may even be questioned whether from the broad outlook of the welfare of the public at large it is to be desired. The reason for this is that hospital education under the supposed ideal system would turn out a comparatively small number of experts instead of a large number of men fairly competent in anæsthetic work. The whole-timers would become, of course, experts, and presumably after a certain number of years in hospital would take up private anæsthetic practice. The average student and resident officer of the hospital, however, would have far fewer opportunities of rendering himself a capable anæsthetist than obtain under our present system. With things as they are he does not become an expert, but with average keenness and intelligence he can deal safely with ordinary methods of anæsthesia and discriminate between the cases which he can handle himself and those which he should delegate to an expert. At the same time it must be admitted that the American system is far more likely to lead, and does actually lead, to more experimental work and to more initiation of novel methods than we originate under our system. The most striking difference between the actual administration of anæsthetics in America and that usual in Great Britain is the complete elimination of chloroform from the former. This difference should render possible an illuminating comparison if reliable statistics of mortalities could be compiled. The American anæsthetists claim no exemption from occasional fatality. Yet they do not employ at all that drug to which the majority of anæsthetic fatalities in Great Britain are attributable. It would add greatly to our knowledge if we were provided from America with records showing in what way fatalities most commonly come about when chloroform is entirely ruled out of anæsthetic administration.

THE CASUAL CONTAMINATION OF FOOD.

We have received from a medical man a cutting from a Melbourne newspaper describing how a vendor of grapes was fined 20*s.* with 21*s.* costs for handling his grapes while he was smoking a cigarette and allowing the ash to drop on the grapes. Our correspondent suggests that Australia is probably ahead of us in this matter of the protection of food. That is so. Within a hundred yards of The Lancet offices we have seen trays of confectionery set down on the kerb overlooked by dust-carts in the act of being laden from the sanitary pails. There can be no doubt to the mind not drilled by daily custom that much carelessness is shown here in the handling of perishable food of all kinds. In the transport of meat, as the result of agitation, some improvement has recently taken place. A few firms now sell wrapped bread. Most people, however, are still content to take in their loaves of bread out of the basket slung on the back of the baker's boy and to eat crusts which have been rubbing against his dirty coat and shoulders. It is no uncommon thing to see the bread dropped on the road in transit from the cart to the basket. Even the dainty Parisian sets us no example in this respect. He buys his long loaves of bread by the foot and one sees him carry them home unwrapped in his hand or shoving a foot of bread into a not too cleanly pocket. Elsewhere in this issue (p. 405) our Paris correspondent has something to say on the subject of hygienic marketing in the French capital. It is perhaps more particularly perishable fruit which calls for better methods. Probably as the result of the substitution of motor for horse traffic the street dust, to which barrows of food are exposed, is less objectionable than formerly. Nevertheless, we imagine few people who are particular about having their food clean will care to purchase strawberries, raspberries, grapes, or plums from a street stall. It is difficult to see how adequate protection can be devised for the selling of fruits from street barrows. Careless and dirty methods are not peculiar to hawkers. Perishable articles of food are exposed in shop windows, and shop assistants in fruit and confectionery shops frequently handle their wares with the familiarity bred of contempt. Licking the fingers before handling the paper bag is not unknown. No doubt regulations could be devised to meet flagrant cases and the fear of penalty would serve to raise the general standard, but the greatest hope lies in the teaching of hygiene in the schools, and in the demonstration by the public that greater care in the handling of perishable food is always a paying proposition.

EARLY TUBERCULOSIS MASQUERADING AS TYPHOID FEVER.

Typhoid fever does much harm indirectly as well as directly, and its eradication will be indirectly beneficial in this—there will no longer be an excuse for mistaking early cases of tuberculosis for typhoid fever. The differential diagnosis is often discussed in the teaching hospitals, and most practitioners are alive to the risks of confusing one disease with the other, but so long as laboratory methods are not employed in every doubtful case, the clinician is apt to go astray, be his clinical acumen never so subtle. This is the lesson of a paper recently published in *Annales de Médecine* by Dr. A. Pellé, who during the past two years has observed as many as 14 cases of pulmonary and pleural tuberculosis begin with all the characteristic features of typhoid fever. Little wonder, therefore, that when he has found a history of typhoid fever in his cases of pulmonary tuberculosis (and in his experience such a history is common) he has come to doubt the accuracy of the diagnosis of typhoid fever. In all his 14 cases the physical reached as to how best to bring pressure to bear upon defaulters. Besides the information we have summarised, the statistical material gives food for thoughtful study.

THE DIAGNOSIS OF TYPHOID FEVER.

Dr. H. Löhr,[1] assistant at the Kiel Medical University Clinic, remarks that during the last two or three years it has been impossible to make the bacteriological and serological diagnosis of typhoid fever so early as before, although the patients come from the same district and the examination is carried out in the same place and under the same experienced supervision. In spite of repeated examinations of the blood, typhoid bacilli can often not be found until the fourth, fifth, or sixth week of disease, and agglutination is first obtained at the same time, while in other cases bacilli may be grown from the blood in the first week, but the agglutination titre does not rise to the level suitable for diagnosis until the fourth or fifth week. In some instances Widal's reaction does not become positive, even in the later weeks. The cause of this delay is not easy to determine. Perhaps the difficulty in growing the bacillus from the blood and the delay in agglutination are due to some hitherto unknown factors or to some change in the reaction in the diseased organism. The insufficient and vitamin-poor food of recent years may possibly have affected the antibody-forming function of the system. In very severe attacks, as in typhoid septicæmia, there is often a complete absence of antibody formation. On the other hand, the height of the agglutination titre does not bear any relation to the character of the attack. Löhr has found that by injection of non-specific protein substances such as milk or caseosan a low agglutination titre in a suspected typhoid case can be raised to a level available for diagnosis and even much higher. 5 c.cm. of milk or 2 c.cm. of caseosan are injected intramuscularly, and 12–24 hours later the blood is examined again by Widal's test. In most cases a rise of titre will be found. If, however, Widal's test is still negative after 24 hours, a larger dose of milk or caseosan should be injected, and the blood examined again in 12, 24, or 48 hours. According to the capacity of the individual to react it will be found that the agglutination titre rises from 1 : 30 to 1 : 200, 1 : 500, or 1 : 2000. In non-typhoid cases, on the other hand, the titre does not rise, unless they have been previously inoculated against typhoid. It is a well-known fact that the agglutination titre in the inoculated may rise after infections of other kinds, such as influenza, as has recently been shown by Curschmann, so that caution should be exercised in the diagnosis of typhoid fever in such cases.

THE CONQUEST OF YELLOW FEVER.

COMMENTING on the work done during the past year in fighting yellow fever in the Americas, the *Journal of the American Medical Association*, in a recent issue, states proudly that "if persons who are engaged in the promotion of preventive medicine ever waver in their faith that progress will attend the effort, their courage and persistence should be further sustained by the recent records of the continued campaigns against yellow fever." Yellow fever no longer exists in North America, Central America is almost free, and Brazil "has reached her final bout with the disease."[2] Previous to the latter half of the eighteenth century yellow fever was unknown in North America, but in 1793 the town of Philadelphia was ravaged by an epidemic which out of a population of 40,000 laid 4000 low. The disease apparently first occurred in the West Indies in 1647, and was then first described, but it received little mention in literature, medical or otherwise, until Charles Brockden Brown, of Philadelphia, published a vivid account of the scourge in his native town. His picture, like Defoe's story of the plague of London, is more illuminating from the historical point of view than helpful in the medical sense. In 1806, Thomas Paine, the great English-American Frenchman, writing on the subject, began to search strenuously for the cause of the disease, and it is interesting to note, as Dr. Arbour Stephens points out,[3] how far Paine's early theories foreshadowed the work that, almost a century later, was to result in the conquest of the disease, when Dr. Reid, of the American Army Medical Service, conducted his heroic investigations in Cuba in the summer of 1900. Paine was a philosopher rather than a scientist, but had his work been followed up by scientifically minded men, one feels certain that the truth would have been discovered much earlier than it was.

PRACTICE ABROAD.

ANYONE who has obtained a medical diploma entitling him to have his name printed in any section of the Medical Register becomes at once entitled to practise with little further formality over the greater part of the globe. The range includes, outside the United Kingdom, all the British Dominions and Crown Colonies, with the single exception of British Columbia. He will only require to present the prescribed evidence of the possession of degree or diploma of registration, and, if asked for, of good character, to the proper authorities in Australia, Canada, Ceylon, Hong-Kong, India, Malta, Newfoundland, New Zealand, the Union of South Africa, and the Straits Settlements, in order to enjoy the full privileges and responsibilities of medical practice. In British Columbia those registered prior to 1887 are so entitled; others must pass an examination before a local board, oral and written, in the final professional subjects. Two countries with which there is at present full medical reciprocity are, along with their colonies, also open to all who are on the British Register. These are Japan and Italy. Belgium was in the same category from 1915 to 1920, when a number of Brussels, Louvain, Ghent, and Liége graduates registered in this country, but in the latter year the Belgian authorities saw fit to discontinue the arrangement, and at the same time the Brussels practitioners' degree, an entirely different affair, was discontinued. There is no let or hindrance to record in the reciprocity with Japan; it has apparently worked harmoniously since it was instituted in 1905. But in Italy a temporary difficulty has arisen. Reciprocity was first established in 1901 when practitioners with Italian qualifications became entitled to all the privileges pertaining to British practitioners, but the latter were admitted only to practise amongst foreigners in Italy. In 1910, however, reciprocity became complete, and British practitioners began to enjoy unrestricted freedom of practice in Italy. Last November a registered British medical practitioner, desiring to practise at Ospedaletti, and with the knowledge of the Italian Consul-General in London, was refused permission to do so by the President of the Provincial Medical Board at San Remo, who informed him that he must first obtain an Italian medical diploma. It appears that the provincial authorities had not been apprised of the special agreement between the two countries, and that the matter is likely to be arranged, although those desirous of settling in Italy should bear these facts in mind.

In regard to practice in foreign countries where reciprocity is not in force, the circumstances vary in every possible degree. In China and Siam, for example, there are no regulations whatever restricting practice, whereas in pre-war Austria it was necessary to become naturalised before practice could be begun. In countries nearer home the regulations in France and Switzerland are of special interest; in both procedure has tended to stiffen of recent years. In France it is now necessary to obtain the baccalauréat and to go through the course of study culminating in a medical degree just as any husband, nor at Mr. Smith's explanation of his symptoms being occasioned by his occupation involving 'a lot of 'ead work' when Mr. Smith means that he carries a heavy basket of fish on his head." Above all, the physician must be possessed of patience, and the acid test of patience Dr. Abrahams describes as: a headache, a hot afternoon, a squalling child sent up with a very deaf old woman, who knows nothing about the patient. But it is just the idea of "hospes" that means so much in the voluntary hospital system, that preserves the intimate relationship between the hospital patient and the doctor, of which, as Dr. Abrahams says, this country is so deservedly proud.

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[1] Deutsche medizinische Wochenschrift, 1924, i., 536–37.

[2] G. E. Vincent: The Rockefeller Foundation: A Review for 1923. New York. 1924.

[3] A. Stephens: Thomas Paine on Yellow Fever, Med. Press and Circular, May 21st, 1924.

AMMONIA AND CHLORINE IN THE DISINFECTION OF WATER.

SOME excessively polluted waters are not sterilised by chlorine supplied in the proportions usually found sufficient. This failure seems to depend on the presence of colloid or albuminoid matters, generally got rid of by sedimentation and clarification, which, according to Major C. H. H. Harold and Captain A. R. Ward,[1] protect the micro-organisms from the chlorine. This action they call "inhibition," and to get over it they propose to add to such water a quarter to a half part of ammonia per million prior to its exposure to chlorine gas, whereby the lethal action of the chlorine on the organisms is increased without any deterioration of taste. The authors observe that in civil life water can be stored to free it of colloids and organisms, but that there is no time for that on service in war, when it is hard enough to get water for daily use; and, besides, water must be sterilised at once. The usual measures proved efficacious almost everywhere, but anomalous results had occurred and lacked explanation at the time. Heavily polluted water being only used in dire necessity it was likely that just at the time there would be no laboratory available to make chemical and bacteriological observations. Therefore the authors set themselves to examine the question. They experimented at first with cholera, typhoid, dysentery, and other excremental organisms, exposing them to chlorine in various strengths for 45 minutes, and on finding *B. suipestifer* the most resistant of them all, they pursued their researches with this organism alone. Definite amounts of broth cultures and of chlorine were added to 200 c.cm. of autoclaved tap-water, the free chlorine remaining after 45 minutes was estimated, the difference, or "deviation," i.e., the amount gone into combination, being a guide to the killing power of the mixture. The deviation was uninfluenced by one kind of organism more than by another, but it was affected by the amount of broth present. Inhibition occurred in the presence of colloids, excess of organisms, fæcal or vegetable matter. When ammonia, about one-third part per million, was added 15 minutes before the chlorine, there was more deviation and the killing power was increased. Rideal showed that ammonia compounds are specially penetrative. Organisms or colloids take up first ammonia and then chlorine; chloramine or other chlorine-ammonia compounds of high coefficient are produced in situ where they exercise their maximum effect. The paper should be widely read by all interested, as it has important bearing on safe campaigning.

THE FIRST ORTHOPÆDIC CLINIC IN HOLLAND.

IT is remarkable that orthopædics have hitherto received so little attention from the medical profession in Holland, but this condition is likely now to be remedied by the opening, at Leiden, of a new orthopædic clinic—the first in the country. For more than ten years a number of infirmary buildings have been under construction in Leiden, supplied with laboratories, clinics, and dispensaries for every branch of medicine at a total cost of some £1,250,000. One of the buildings, which was originally designed for a fever hospital, has been allocated to the Society for the Welfare of the Crippled and Disabled. This hospital has accommodation for 40 beds, 20 of which will be paid for by the Government and will be used for teaching purposes. Dr. Murk Jansen, who is now lecturer in orthopædic surgery at the university, has been appointed director. Many difficulties had to be overcome before this project could be carried out. The strong opposition to the establishment of the clinic on the part of some surgeons is noteworthy, our Dutch correspondent writes, as giving an idea of the old-fashioned professional outlook in Holland in certain directions. The surgeons there have continually opposed the separation of any branch of medicine from surgery, and for this reason it took a long time before oto-rhino-laryngology, dermatology, and urology became separate specialties. For the same reason, too, there are in Holland no surgeons who specialise in surgery of the abdomen or brain. It must be remembered that for many years in all the British medical centres specialism was looked at with considerable suspicion, one fact being insisted upon and another fact suppressed. It was continually pointed out that there could be no sound specialism that was not founded on general medicine, but it was a long time before it was allowed that progress along special lines would be most surely arrived at by special work. The first is true, but the second is no less true. The establishment of the new clinic, under an orthopædic surgeon so well known as Dr. Jansen, should do a great deal to further in Holland the development of this branch of medical science.

COMPULSION IN THE TREATMENT OF VENEREAL DISEASE.

THE experiments on compulsory notification of venereal diseases abroad are being watched with keen interest at home. Some time ago the journal of the National Council for Combating Venereal Diseases published results achieved by the methods in force in Australia and Canada, and replies received to a questionnaire issued to State and public health departments in August last appear in its pages for July.[1] In *Queensland*, of the 568 cases notified for failure to continue treatment, 365 resumed after being warned, 4 were summoned (of whom 3 then resumed treatment), and 4 were brought before the court and fined. In Queensland it seems that in general the infected are only too willing to continue treatment, it is the nomad population which defaults. In *Tasmania* four defaulters resumed after being followed up by an official of the department and no cases were brought before the court. In Tasmania notification and compulsory treatment has, it is stated, not led to concealment, but yet has not achieved the good results expected. The tracing of contacts has proved quite unsuccessful. In *Victoria*, of the 6599 cases in six years who discontinued treatment, 3099 were traced and 3028 resumed, 71 were summoned (63 of them then resuming treatment), and 8 were brought before the court. The fear of publicity is felt in Victoria to have had some effect in causing concealment of disease, but the notification of a defaulter by name has not diminished attendance. In *West Australia*, of 320 defaulters 232 were traced, 24 were brought before the court, 16 cases being withdrawn, and 8 were fined. Here notification and compulsory treatment has not led to concealment or diminution of attendance, although wrong addresses are given which lead to difficulty in tracing defaulters. In *Ontario* 5 per cent. of cases discontinued treatment too soon; the scheme has not led to concealment or to diminution of attendance. In *Quebec* no legal measures are taken to induce patients to continue treatment, and it is felt that even confidential notification prevents the patient from coming to the clinic. It is evident that the effect of compulsion in the treatment of venereal disease is not proving easy to assess, and although the steps taken to deal with those who discontinue treatment have achieved a large measure of success, unanimity has not yet been reached as to how best to bring pressure to bear upon defaulters. Besides the information we have summarised, the statistical material gives food for thoughtful study.

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[1] Journal of the R.A.M.C., June and July, 1924.

[1] Health and Empire, July, 1924.

THE DIAGNOSIS OF TYPHOID FEVER.

Dr. H. Löhr,[1] assistant at the Kiel Medical University Clinic, remarks that during the last two or three years it has been impossible to make the bacteriological and serological diagnosis of typhoid fever so early as before, although the patients come from the same district and the examination is carried out in the same place and under the same experienced supervision. In spite of repeated examinations of the blood, typhoid bacilli can often not be found until the fourth, fifth, or sixth week of disease, and agglutination is first obtained at the same time, while in other cases bacilli may be grown from the blood in the first week, but the agglutination titre does not rise to the level suitable for diagnosis until the fourth or fifth week. In some instances Widal's reaction does not become positive, even in the later weeks. The cause of this delay is not easy to determine. Perhaps the difficulty in growing the bacillus from the blood and the delay in agglutination are due to some hitherto unknown factors or to some change in the reaction in the diseased organism. The insufficient and vitamin-poor food of recent years may possibly have affected the antibody-forming function of the system. In very severe attacks, as in typhoid septicæmia, there is often a complete absence of antibody formation. On the other hand, the height of the agglutination titre does not bear any relation to the character of the attack. Löhr has found that by injection of non-specific protein substances such as milk or caseosan a low agglutination titre in a suspected typhoid case can be raised to a level available for diagnosis and even much higher. 5 c.cm. of milk or 2 c.cm. of caseosan are injected intramuscularly, and 12–24 hours later the blood is examined again by Widal's test. In most cases a rise of titre will be found. If, however, Widal's test is still negative after 24 hours, a larger dose of milk or caseosan should be injected, and the blood examined again in 12, 24, or 48 hours. According to the capacity of the individual to react it will be found that the agglutination titre rises from 1 : 30 to 1 : 200, 1 : 500, or 1 : 2000. In non-typhoid cases, on the other hand, the titre does not rise, unless they have been previously inoculated against typhoid. It is a well-known fact that the agglutination titre in the inoculated may rise after infections of other kinds, such as influenza, as has recently been shown by Curschmann, so that caution should be exercised in the diagnosis of typhoid fever in such cases.

THE CONQUEST OF YELLOW FEVER.

COMMENTING on the work done during the past year in fighting yellow fever in the Americas, the *Journal of the American Medical Association*, in a recent issue, states proudly that "if persons who are engaged in the promotion of preventive medicine ever waver in their faith that progress will attend the effort, their courage and persistence should be further sustained by the recent records of the continued campaigns against yellow fever." Yellow fever no longer exists in North America, Central America is almost free, and Brazil "has reached her final bout with the disease."[2] Previous to the latter half of the eighteenth century yellow fever was unknown in North America, but in 1793 the town of Philadelphia was ravaged by an epidemic which out of a population of 40,000 laid 4000 low. The disease apparently first occurred in the West Indies in 1647, and was then first described, but it received little mention in literature, medical or otherwise, until Charles Brockden Brown, of Philadelphia, published a vivid account of the scourge in his native town. His picture, like Defoe's story of the plague of London, is more illuminating from the historical point of view than helpful in the medical sense. In 1806, Thomas Paine, the great English-American Frenchman, writing on the subject, began to search strenuously for the cause of the disease, and it is interesting to note, as Dr. Arbour Stephens points out,[3] how far Paine's early theories foreshadowed the work that, almost a century later, was to result in the conquest of the disease, when Dr. Reid, of the American Army Medical Service, conducted his heroic investigations in Cuba in the summer of 1900. Paine was a philosopher rather than a scientist, but had his work been followed up by scientifically minded men, one feels certain that the truth would have been discovered much earlier than it was.

PRACTICE ABROAD.

ANYONE who has obtained a medical diploma entitling him to have his name printed in any section of the Medical Register becomes at once entitled to practise with little further formality over the greater part of the globe. The range includes, outside the United Kingdom, all the British Dominions and Crown Colonies, with the single exception of British Columbia. He will only require to present the prescribed evidence of the possession of degree or diploma of registration, and, if asked for, of good character, to the proper authorities in Australia, Canada, Ceylon, Hong-Kong, India, Malta, Newfoundland, New Zealand, the Union of South Africa, and the Straits Settlements, in order to enjoy the full privileges and responsibilities of medical practice. In British Columbia those registered prior to 1887 are so entitled; others must pass an examination before a local board, oral and written, in the final professional subjects. Two countries with which there is at present full medical reciprocity are, along with their colonies, also open to all who are on the British Register. These are Japan and Italy. Belgium was in the same category from 1915 to 1920, when a number of Brussels, Louvain, Ghent, and Liége graduates registered in this country, but in the latter year the Belgian authorities saw fit to discontinue the arrangement, and at the same time the Brussels practitioners' degree, an entirely different affair, was discontinued. There is no let or hindrance to record in the reciprocity with Japan; it has apparently worked harmoniously since it was instituted in 1905. But in Italy a temporary difficulty has arisen. Reciprocity was first established in 1901 when practitioners with Italian qualifications became entitled to all the privileges pertaining to British practitioners, but the latter were admitted only to practise amongst foreigners in Italy. In 1910, however, reciprocity became complete, and British practitioners began to enjoy unrestricted freedom of practice in Italy. Last November a registered British medical practitioner, desiring to practise at Ospedaletti, and with the knowledge of the Italian Consul-General in London, was refused permission to do so by the President of the Provincial Medical Board at San Remo, who informed him that he must first obtain an Italian medical diploma. It appears that the provincial authorities had not been apprised of the special agreement between the two countries, and that the matter is likely to be arranged, although those desirous of settling in Italy should bear these facts in mind.

In regard to practice in foreign countries where reciprocity is not in force, the circumstances vary in every possible degree. In China and Siam, for example, there are no regulations whatever restricting practice, whereas in pre-war Austria it was necessary to become naturalised before practice could be begun. In countries nearer home the regulations in France and Switzerland are of special interest: in both procedure has tended to stiffen of recent years. In France it is now necessary to obtain the baccalauréat and to go through the course of study culminating in a medical degree just as any

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[1] Deutsche medizinische Wochenschrift, 1924, i., 536–37.

[2] G. E. Vincent: The Rockefeller Foundation: A Review for 1923. New York. 1924.

[3] A. Stephens: Thomas Paine on Yellow Fever, Med. Press and Circular, May 21st, 1924.

French student would have to do. There is no privilege accorded to medical diplomates as such. In Switzerland it is now obligatory to pass all three professional examinations, as well as the matriculation examination, in the right order; but there is still apparently no obligation to attend courses of study other than are necessary to pass the examinations. In the case of Switzerland there is no reason to believe that the protective measures have been framed in any way with regard to this country; in a land so largely populated by permanent or temporary visitors from adjacent countries of similar speech some such action may be required if it is desired to retain medical practice in the hands of the Swiss themselves. Probably the temporary difficulty in Italy was of the same nature. Negotiations in regard to reciprocity with Spain have made no progress.

FERTILITY AND STERILITY IN DOMESTIC ANIMALS.

The School of Agriculture, Cambridge, is exhibiting a case in the Agricultural Section of the Government Pavilion at Wembley which should prove of interest to medical men, if not directly, at least from the point of view of comparative physiology. The exhibit consists of a series of photographs, statistical tables, and macroscopic preparations illustrating the work of Mr. J. Hammond, M.A., on Fertility and Sterility in Domestic Animals. Sterility in the male receives a passing reference. The physiology of reproduction in the cow is illustrated by means of an excellent specimen of the reproductive apparatus which brings out all the salient, if familiar, features. There follow sections showing various causes of sterility, whether physiological or pathological. Thus, there are specimens of ovaries of calves before puberty, ovaries of heifers during the œstrual circle, when the corpus luteum has formed; and, in this connexion also, ovaries from which the corpus luteum has been artificially expelled and a premature "heat" period thus induced. For it is believed that the active corpus luteum utilises some substance ("generative ferment") present only in small quantities in the blood, which is necessary for the growth of the follicle, and whose absence prevents the follicle ripening. Pathological ovaries, in which there is a cystic condition, a persistent corpus luteum, or a tuberculous lesion, are also shown. Some further points are brought out in the section dealing with fertility in the sow. It is shown, for instance, that the older sows produce at a heat period more ripe follicles than the younger. Consequently the latter have on the average smaller litters. This is ascribed to the fact that young growing animals have not so much "generative ferment" available for the ovaries. Atrophy of young embryos is illustrated, and it is concluded that, whatever the cause, this condition is not due to overcrowding in the uterus. The further suggestive point is made that, in the rabbit, the time of year and the factor of domestication play a part. Under Fertility in the Rabbit the series of cross-sections of uteri of suckling and non-suckling rabbits at four-day intervals after parturition is of great interest from the comparative point of view. It is suggested that the atrophy of the uterus is probably brought about by the mammary glands utilising "generative ferment" which is necessary for the activity of the ovaries; for the follicles and corpora lutea become atrophic and the ovarian secretion necessary for the nutrition of the uterus is not produced. These effects may be counteracted by allowing the doe to suckle only a few young, or by feeding heavily with oats and juicy green food. Altogether the exhibit well repays the close scrutiny which is necessary for a clear understanding of its significance.

The Crown authorities have appointed Mr. Archibald Young, B.Sc, M.B., C.M., F.R.F.P.S. Glasg., to the Regius Chair of Surgery in Glasgow University, in succession to the late Sir William Macewen.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXV.—THE TREATMENT OF MARASMUS IN INFANTS.

The basal metabolism of the infant has been found to fall outside the limits of the normal when the child has lost one-fifth of its body-weight. A child therefore can be considered as marasmic if its weight is less than four-fifths of the expected weight for its age. Marasmus may be primary, a "vice of nutrition" only; or secondary to some other disease. The patient may have recovered from the original disease; if not, then treatment must be directed to it as well as to the marasmus. Disorders of digestion are not infrequent, but many cases run their course without any digestive disturbance. In the treatment of marasmus breast-milk should be given whenever available, even if partial breast-feeding only is possible. In the absence of breast-feeding the best results are obtained by using modifications of cows' milk. Having started feeding with such a mixture, it is important to continue with this form of food for a considerable time, for frequent changes in the kind and composition of the food lead but to disappointment or disaster. Not infrequently the regularisation of the time of feeding and strict attention to detail will produce improvement in an atrophic child who has previously not improved on a diet with which no fault could reasonably be found. Marasmic children are very susceptible to cold, and many have a subnormal temperature; the supplying of artificial warmth is therefore very important.

The marasmic baby should be given more food than a normal baby of the same weight. It should be the rule to feed by the expected weight for its age rather than by actual weight, or if the caloric system is used, to give the child about 70 calories per pound per diem. The total calories of a milk mixture can easily be calculated if it be remembered that 1 oz. of milk (4 per cent. fat) has a caloric value of 20, and 1 oz. of sugar a caloric value of 120. When treatment is first instituted many babies will not take this amount of food, but after a time they will usually do so, and many will take even larger amounts. It is advisable to use one of the less fermentable sugars because of the tendency towards carbohydrate indigestion. Therefore dextrimaltose (Mead's preparation is a useful one) should be used in preference to lactose or cane sugar. The caloric value of a feed may be increased by the addition of carbohydrate in this form, which, in the absence of diarrhœa, is well absorbed. The amount used can be 5 to 10 per cent. Additional cream may be used to bring up the caloric value of the food, but is unnecessary because the amount of cream in an ordinary good milk is sufficient for the needs of the child. The marasmic child is able to digest that amount of fat as well as the normal child. The marked cases of fat indigestion described by German writers are rare in this country. If a dried milk be preferred to fresh milk, a half-cream variety should be used, since the fat absorption is better than with the full-cream variety.

Digestive Disturbances.

Marasmus may be complicated by digestive disturbances, and although many of the varieties are not quite sharply defined, mixed forms occurring in many instances, and even one form supervening on another, yet they can be roughly classified thus: (1) Fat indigestion; (2) carbohydrate indigestion; (3) protein indigestion; (4) pylorospasm; and (5) diarrhœa and vomiting.

Fat Indigestion.—This occurs chiefly under two conditions—(*a*) if diarrhœa develops; (*b*) if high fat content dried milks are used. In the latter group the fat indigestion is recognised by the passage of large pale soap stools. Unless the soap stool is a bulky one fat indigestion does not occur. The form of fat indigestion described by German workers may be included in this group. In the cases showing diarrhœa, particularly if this is severe and of sudden onset, a preliminary period of starvation, during which the child is given water, tea, or albumin water freely, and lasting 6 to 12 hours, is advisable. In many cases, however, the child is too feeble to submit to this form of treatment. If the child is dehydrated, normal saline should be given by rectum or subcutaneously. The dietary should be a low fat one, and the carbohydrate given should be in the form of dextrimaltose. The low fat dietary can be obtained by giving skimmed milk in place of whole milk. The milk should be machine-skimmed, or one of the dried skimmed milks may be used. Horlick's malted milk, diluted 1 in 8, gives a mixture which is very useful in the treatment of diarrhœa, and containing a low fat percentage. Sweetened condensed milk in the same or greater dilutions also proves useful in some cases, for it also has a low fat and a high carbohydrate content; its use, however, is limited because in many cases the sugar increases the tendency to diarrhœa. One other form of feeding is sometimes useful as a temporary measure—i.e., the giving of protein milk. This method of feeding is described under carbohydrate indigestion. The low fat mixture can be continued for a considerable period, but an attempt should be made to increase the amount of fat as soon as possible, because of the danger of vitamin A starvation and of abnormal calcium metabolism. The treatment of the second group of indigestion consists either in substituting for the dried milk a half-cream variety of the same brand or an ordinary milk mixture. It is rarely necessary to give the very low fat mixture described in the first group.

Carbohydrate Indigestion.—This is the most frequent form of indigestion. The stools are acid, loose, and green, and may show mucus and soap curds; vomiting and colic are frequent, and the child develops sore buttocks; diarrhœa is very liable to occur. These cases arise most frequently on artificial foods or where lactose or cane sugar are used as the sweetening agents. Most of these children improve when a normal milk mixture, sweetened with dextrimaltose, is used, but it may be necessary to omit all added sugar before the symptoms clear up completely. If diarrhœa occurs the methods outlined under fat indigestion should be used. It is in this form of diarrhœa (fermentative diarrhœa) that the best results are obtained from protein milk, and this form of feeding will frequently clear up cases that have resisted all other forms of treatment. Protein milk may be easily prepared by the addition of calcium caseinate, sold under the name of "Casec" by Mead Johnson and Co. For children over 3 months of age 20 gr. of this powder can be added to every ounce of milk. This method of feeding is, however, a temporary expedient, since many children after improving and gaining weight fail to show satisfactory progress and may even develop protein indigestion.

Protein Indigestion.—Fortunately this is the rarest form of indigestion, since it is necessary to give all artificially-fed babies a greater amount of protein than breast-fed babies, due probably to the different amino-acid contents between cows' milk and human milk. Protein indigestion only occurs where an excess of protein is present in the food over a long period. It is shown by the presence in the stool of large hard brownish curds, very different in consistence and appearance from the soft white smaller curds of neutral fat or soap, and which previously were regarded as evidence of protein indigestion. The treatment of protein indigestion is the giving of milk mixtures in the ordinary dilutions and without the addition of extra protein; the addition of 1, 2, or 3 gr. of sodium citrate to the ounce of milk is also helpful.

Pylorospasm.—This is a group of cases important to recognise, because treatment is often very successful. Vomiting is frequent, often severe; constipation or diarrhœa may be present, also anorexia and wasting. On examination gastric peristalsis may be seen, rarely marked in degree; a pyloric tumour is not palpable. Efficient X ray examination will establish the diagnosis. The treatment most likely to be successful is daily lavage of the stomach with 1 per cent. bicarbonate of soda solution, and the giving of an ordinary milk mixture. Citration of the latter is often very helpful. In certain cases the addition of ½ gr. of bicarbonate of soda to the ounce of milk initiates an improvement. If these methods are unsuccessful the effect of atropine may be tried. The solution of atropine sulphate should be made up freshly every two or three days, the strength of the solution being ½ gr. of atropine sulphate in 1 oz. of distilled water—i.e., each minim contains 1/960 gr. The initial dose is 1 minim given 15 minutes before each feed; this can be increased to 2 or 3 minims if symptoms continue and if no sign of overdosage with atropine is observed. The signs of overdosage are flushing and intestinal distension.

Vitamins.—The vitamin content of the diet is of great importance both in the production of marasmus and in its treatment. Absence of fat in the food—e.g., the use of machine-skimmed condensed milk—will produce atrophy, and it is essential in treating marasmus to give an adequate supply of fat in the food to ensure the presence of vitamin A and of the calcium depositing (anti-rachitic) vitamin. Some dried humanised milks have a relatively poor calcium content and are not suitable for prolonged use in marasmus, even if the vitamin content is satisfactory. The amount of calcium in ordinary cows' milk, although variable, is sufficient for the needs of the child.

Fruit juice should be given daily to marasmic infants, since a certain number of cases fail to make satisfactory progress until this is done. The same remark is true of vitamin B, an adequate supply of which can be ensured by adding 1 drachm of marmite to the 24 hours' supply of milk.

Acid Milk.

The use of "acid milk" has certain advantages in the treatment of marasmic infants over 3 months of age. The buffer value of cows' milk is high—i.e., it contains a considerable amount of substances capable of combining with acid without undergoing a change in reaction. Pepsin can only act at a certain degree of acidity, and to produce that acidity in cows' milk requires the addition of three to six times the amount of acid required to bring breast-milk to the same degree of acidity. Cows' milk, therefore, involves a greater task on the part of the child's stomach than breast-milk. The buffer can be neutralised in several ways—(1) by extreme dilution; (2) by drying milk; (3) by the addition of acid; hydrochloric, citric, and lactic acids have been used. Hydrochloric acid milk is prepared by the addition of 2 drachms of decinormal hydrochloric acid and 2 drachms of water to every ounce of milk. The acid should be added to the milk, and not vice versa, or clotting will occur; clotting may also occur if the milk is not fresh or is made too hot. Citric acid milk is prepared by the addition of ½ g. of citric acid to each ounce of milk, to this mixture is added an equal quantity of water. Milk prepared in this way has almost the same hydrogen-ion concentration as breast-milk.

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BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 353.)

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

WEDNESDAY, JULY 23RD.

THIS section met on three days at the Technical College, Bradford, Dr. JOHN S. FAIRBAIRN (London), President of the section, occupying the chair. Dr. J. ABERNETHY WILLETT (London) opened a discussion at the first meeting on the

Methods of the Antenatal Clinic and their Application to Private Practice.

Dr. Willett said that he proposed to take as a basis the methods and results of a year's (1923) practice in the antenatal department of the City of London Maternity Hospital and to consider how far they might be applied to private practice, confining his remarks to the clinical aspect of the subject. His personal experience of non-supervised pregnancy was small, the results of omission being exemplified by the emergency admissions, for at the clinic routine examination was made in all primigravidæ and all multiparæ with a history of any abnormality. There were, he said, two definite phases or periods in antenatal work: the first from conception to viability of the fœtus, which was concerned with preservation of pregnancy and the health of the mother; the second from viability onwards, when the aim was that of obviating untoward developments during labour.

First Phase: From Conception to Viability of Child.

Owing to lack of sufficient material he did not propose to enter into detail upon the preventive aspects during this phase, as by the rules of the City of London Maternity Hospital patients were not usually seen until the twenty-eighth week. He felt sure that later speakers, especially those in private practice, would be able to tell the section what proportion of patients sought their advice during pregnancy, what were the more common ailments, and how best they were treated. He emphasised the value of seeing patients early in this first phase, the accomplishment of which meant educating and explaining to mothers the value of antenatal methods. He referred to the importance of obtaining the medical history, the routine examination of heart, lungs, and urine, and also a few hints on personal hygiene—such as modification of diet, the ingestion of plenty of fluid, and care of the breasts; and finally, that patients be warned to report anything abnormal. He then proceeded to discuss some of the more important major complications of early pregnancy, including vomiting, abortion, tuberculosis, morbus cordis, and venereal disease.

Complications of the Second Phase.

The number of patients examined was 2145, and of these 204 were found to have some abnormality which required treatment or investigation, which were grouped as follows: (1) Albuminuria: The most frequent abnormality, occurring in 57 cases, or 27·9 per cent. of cases requiring treatment; of these only 4 were admitted as in-patients; in no case did eclampsia develop. (2) Pyelitis of pregnancy: Rare; 0·4 per cent. as determined by bacteriological examination. (3) Abnormal presentation: One shoulder and two face presentations; not recognised by antenatal examination; probably developed at onset of labour. (4) Breech presentations: Probably occurred more commonly than was usually thought. Diagnosis usually easy, except under certain circumstances, when X rays might prove helpful. He advocated external version. (5) Misfits: The cardinal sign of this group was unduly high situation of the fœtal head; there were 24 instances. These were mostly in patients with a pelvis described as "under average." The occipito-posterior was another cause. (6) Occipito-posterior position: No treatment was advised if the head was deeply engaged, but if the head was high he recommended the "Buist" method of rotation.

Examination and Treatment.

The speaker emphasised the importance of noting the shape of pelvis and gave an easy and satisfactory method of doing this without the aid of callipers. He then explained his method of palpating the head by abdominal examination, using the palm of his hand and finger-tips. It was essential to push the head down in the axis of the brim, to note the relationship of the parietal eminence to the pubes, and also the antero-posterior thickness of the latter. He was in the habit of teaching that a palpable parietal was to be regarded as a warning during pregnancy and a danger signal in labour. He hesitated to say much about vaginal examinations in these cases, but in his opinion they should be regarded as confirmatory, and unless the head had engaged very little information would be obtained. He personally relied more and more on results obtained by abdominal examination. He realised that there must be two schools of thought as to the correct treatment of abnormal cases: he personally favoured the induction method as more nearly approaching the physiological ideal. He said that induction of labour was practised for the high position of the head in 24 instances—5 approximately at full time and 19 varying at dates from 36 weeks onwards. There was no maternal mortality, but one infant stillborn. Forceps were needed on one occasion only. Cæsarean section for cases with grosser deformities of the pelvis or for bad obstetric histories was performed on 13 cases, all of which recovered.

Labour was induced on 16 occasions for post-maturity with no maternal or fœtal mortality. Owing to the uncertainty of dates he adopted the general rule of inducing 300 days after the last reputed period.

The routine in cases of ante-partum hæmorrhage was to admit all the severe cases and the others were advised to rest at home and to return at once if hæmorrhage recurred. He found that examination before dilatation disclosed very little, and he sometimes thought that treatment after the thirty-sixth week should be active dilatation under anæsthesia to admit one finger inside the uterus.

Dr. Willett then drew attention to the three common types of emergency admission resulting from non-supervised pregnancy and illustrated them by actual examples. Antenatal supervision was not only for the patient's interest, but also for the peace of mind of the doctor, for much of the unpopularity of midwifery was due to its uncertainty, and antenatal work should remove much of this. It should also prevent or minimise the complications of pregnancy and labour, and by reducing operative interference there should be a corresponding fall in septic puerperal mortality and morbidity rate.

Dr. RHODA ADAMSON (Leeds) gave her experience of a large prematernity clinic instituted in connexion with the Ministry of Munitions during the war. She was a strong supporter of antenatal supervision and especially advocated the investigation of vaginal discharges during pregnancy, and also a Wassermann reaction being performed. In all suspicious cases, even though the Wassermann was negative, she advised the carrying out of thorough anti-syphilitic treatment.

Dr. ENEAS K. MACKENZIE (Tain, N.B.) gave an interesting account of antenatal methods as carried out by him in a rural practice in the Scottish Highlands. This practice was situated in the Easter Ross district and involved an average of 3700 visits and 2400 consultations per annum, and this meant over 11,000 miles travelling. Since 1915 his average number of confinements per annum was 77, and of these 33 per cent. were primiparæ. The practice was typically rural, the patients were mostly fisherfolk and crofters who lived in one or two-roomed cottages without any conveniences. The difficulties of distance and locomotion were great and the question he had to answer was: "Could he, single-handed, devote the necessary time and care as to satisfy the ideals upon which this paper was based?" He unhesitatingly answered in the affirmative; not only so, but he found that antenatal care and the knowledge which it gave, not only removed the anxieties of his practice in these cases, but simplified his procedure, and in the end made his actual work less. He then gave the details of his methods of antenatal care. He had attended 680 confinements since 1915, of which 224 were primiparæ. There were only 11 stillbirths, and no cases of puerperal fever. The maternity mortality was nil. Forceps were used in 212 cases. In the early days of his practice he had met with opposition, especially at the hands of the old "howdie," or handywoman, but this had been soon overcome.

Major **Edward Moss**, R.A.M.C., gave the result of four years' practice, from 1920 to 1923 inclusive, at the Louise Margaret Hospital, Aldershot. Of 1850 women who were confined all of them had had antenatal supervision and there was only one death; the forceps-rate was 7 per cent. He considered it most important to recognise the early symptoms of pregnancy toxæmias and to admit these cases to hospital for preventive treatment. During this period he had had four cases of eclampsia. It was interesting to note that of these cases three occurred during the first year, one in the second year, and none during the third and fourth years. He believed this to be due to more efficient antenatal treatment. In his concluding remarks he made a strong plea for universal antenatal supervision with the provision of specially equipped maternity hospitals for the poorer classes.

Discussion.

Dr. R. W. **Johnstone** (Edinburgh) referred to the pioneer work of the late Dr. J. W. Ballantyne, of Edinburgh, in this connexion. The older obstetricians were inclined to think that antenatal observation meant merely testing of the urine and the examination of the pelvis, but the more antenatal care was practised, the more obvious it had become that there were many other conditions to be attended to. He gave a short résumé of the work of the antenatal department in the Royal Maternity Hospital, Edinburgh, in the year 1923-24, during which time many cases of pyelitis, hyperemesis, cardiac and pulmonary disease had been admitted to the antenatal department, in addition to a large number of albuminurias. Of 58 cases of albuminuria, including pre-eclamptics, admitted for treatment only one had actually developed into eclamptic fits, although several others had had labour induced as a prophylactic measure. With regard to the question of disproportion between the head and the pelvis, he thought that Mr. Willett had treated pelvimetry rather cavalierly, and he was inclined to deprecate the rough-and-ready methods of estimations which the opener of the discussion advocated. He advised a vaginal examination in all cases, as thereby one could rapidly estimate the diagonal conjugate, ascertain by Munro Kerr's method exactly how the head entered the pelvis, and at the same time exclude any abnormal conditions in regard to the soft tissues. In minor cases of disproportion induction of labour was practised, and he drew attention to the value of the pituitrin method as particularly applicable to private practice. His method was to begin by sensitising the uterus with several doses of 5 gr. of quinine in solution, then 1 oz. of castor oil was given, and an injection of pituitary extract commenced some two hours after the castor oil had acted. The pituitary extract was injected in 0·5 c.cm. doses at intervals of 20 minutes to half an hour, until either the patient had had six such doses or pains had begun. If no pains eventuated the course of pituitary extract was repeated 24 hours later, and a second failure was followed by recourse to induction by bougies. The drug method was reasonably successful—no method of induction of labour being uniformly so—and had the advantage that it obviated anything in the nature of manual interference. In closing, Dr. Johnstone referred to the report of the Scottish Commission on Puerperal Morbidity, one of whose recommendations was to the effect that the Insurance Act should be so altered that maternity benefit should be refused to women whose domestic circumstances were such as to make it desirable that they should not be confined at home, and yet who refused to go into hospital. If fever cases were compelled to go into hospital in the interests of the public, surely women in such circumstances should be forced to go into a maternity hospital for their confinements in the interests of the State.

Mr. **Aleck Bourne** (London) said that in his experience ante-partum hæmorrhage, not of the slight menstrual type but more of the "gushing" variety, which was associated with a non-engaged head or a breech presentation, was a symptom of placenta prævia and should be treated as such. On the other hand, if the head was well engaged and this was combined with a trace of albumin, the case should be treated as one of accidental hæmorrhage. In contradistinction to Dr. Willett he was an enthusiast for callipers, as they were easy and accurate in use. He did not think that the intercristal and interspinous diameters were of much value except in grossly abnormal cases, and he relied more on the external conjugate. Mr. Bourne also wished to disagree with the opener on the question of vaginal examinations which, in his opinion, should be made on all primiparæ. As regards contraction of the pelvic outlet, he was convinced it was a definite entity and quoted a recent case in support of this contention.

Dr. F. **Edge** (Birmingham) referred to the danger of the work of antenatal clinics being carried out by people who had not received a thorough training in this important branch.

Dame **Janet Campbell** (Ministry of Health) thought that, with the majority of practitioners in this country, antenatal care was more the exception than the rule. She said that over 500 antenatal clinics had been established, most of them in conjunction with an infant welfare centre. She was strongly in favour of these clinics being conducted by people with special knowledge of the subject The speaker supported Dr. Willett's suggestion in reference to the treatment of ante-partum hæmorrhage.

Several other speakers also took part in the discussion.

The **President**, after emphasising the importance of antenatal work, said that to his mind the main interest of to-day's discussion lay in the unanimity of all the speakers in favour of antenatal supervision; whereas, at a similar meeting at Portsmouth 12 months ago the majority were against it owing to the difficulties of conducting this work in practice. In referring to the controversial subject of the "pelvic outlet" he was of the opinion that these cases did occur, and he was sure that anyone who had experienced such a case as Mr. Bourne described would be convinced of its existence. As regards ante-partum hæmorrhage, he thought Dr. Willett's procedure might be suitable for cases in outlying districts where no suitable hospital accommodation was present.

Dr. **Willett** briefly replied to the various points raised in the discussion.

THURSDAY, JULY 24TH.

On the second day Prof. B. P. **Watson** (Edinburgh) read a paper on

Imperfect Urinary Control following Childbirth and its Surgical Treatment.

The speaker drew attention to the fact that there were a very considerable number of women who under some physical exertion were unable to hold their water. Out of a series of 63 cases of cystocele operated upon by him at the Toronto General Hospital, this complaint was only mentioned in 19 histories. He, however, had sent out a questionnaire 18 months ago and it was found that an additional 22 had suffered from this trouble prior to operation, making a total of 41. In 21 of his private cases 18 had incontinence of urine, and in 99 cases operated upon at the Royal Infirmary, Edinburgh, during the last 18 months 61 were found to be suffering from lack of control. Thus in a total of 183 cases of cystocele, incontinence of urine was present in 120, or 66·1 per cent.; but he believed the percentage was considerably higher as a number of the patients did not reply to his questionnaire. The speaker attributed the condition to sagging of the neck of the bladder away from its normal attachment behind the pubis. The sphincter was not interfered with, but had merely lost its "point d'appui." In his opinion the condition was due to a weakening of the musculo-fascial pubocervical layer which normally supported the base and neck of the bladder. The anatomy of this layer, composed mostly of unstriped muscle, was recently described by Bonney, with whom he was in almost entire agreement.

Although incontinence of urine occasionally occurred in nulliparous women, he was convinced that parturient injuries were the main factor in its causation. During labour, when the fœtal head came down upon the pelvic floor, there was over-stretching, and this was aggravated in a large number of cases by the obstetrician attempting to save the perineum at the expense of the anterior pelvic supports. As a prophylactic measure, he therefore recommended episiotomy in all cases of undue stretching and especially in breech presentations in primiparæ.

Treatment.

Prof. Watson then described a satisfactory operation which was similar to one devised by Eden and Lockyer for cystocele. The vertical incision, however, should reach almost to the urethral meatus, and in addition it was necessary to dissect out the pubocervical layer. Special attention was paid to overlapping the cut ends of this fascia at the base of the bladder by means of Lembert sutures, the top suture being the most important. Catgut was used throughout the operation.

The after-treatment was of the greatest importance, and he recommended the use of a self-retaining catheter for at least five days after the operation, and in some cases ten days. The results of 105 cases operated upon were as follows: (1) Perfect control, 65·7 per cent.; (2) control not perfect but better than before, 21·9 per cent.; (3) no improvement, 12·4 per cent. The paper was illustrated by lantern slides and drawings.

Discussion.

Dr. R. W. JOHNSTONE said that to isolate the pubocervical fascial layer which Prof. Watson had described was a much easier thing than description would perhaps lead one to think. Along with most gynæcologists, the speaker had usually been content to tighten up the neck of the bladder by means of a purse-string suture, but he was inclined to think that the technique which had been described was more anatomically correct, and ought to lead to more uniform success in the treatment of the imperfect urinary control. He entirely agreed with Prof. Watson as to the prophylactic value of episiotomy, particularly in primiparous breech cases, where the perineum would otherwise have been torn. An episiotomy incision obviated a great deal of difficulty in many cases and enabled a much more accurate coaptation of the cut edges to be made than in a ragged tear, with, as a consequence, a cleaner and stronger healing.

The CHAIRMAN, in thanking Prof. Watson for his paper, said that the condition was frequently met with in practice but sadly neglected in text-books. Prof. Watson had worked the ætiology out on scientific lines and had shown how restoration of the pubocervical musculo-fascial layer would, in a considerable number of cases, cure the condition.

Prof. MILES PHILLIPS (Sheffield), while expressing entire agreement with Prof. Watson, said he understood the experience at Manchester was that the majority of patients with cystocele did not suffer from urinary incontinence. He also concurred with Prof. Watson in advocating prophylactic episiotomy in primiparæ.

Mr. JAMES PHILLIPS (Bradford) read a paper on

Investigation, Pathology, and Treatment of Uterine Bleeding.

He said that the points he wished to emphasise were the following: (1) In some 25 per cent. of cases the bleeding was associated with malignant disease; (2) the whole of the patient's symptoms and disability should be elicited; (3) the goal of treatment should be as complete restoration as possible to functional normality. As regards pathology, of 292 women at or after the fortieth year treated in home or hospital (1919–23) there were 61 cases of malignant disease. The difficulty of diagnosing the earlier cases of cancer was emphasised and cases cited where previous diagnostic curettage had not revealed malignant disease which was subsequently recognised at operation. In investigating a case a full and consecutive history of the patient's illness and symptoms was necessary, and whenever the diagnostic bimanual examination failed to establish the diagnosis, it was urged that the only safe procedure was to have recourse to surgery—either diagnostic or radical. In considering treatment, he was strongly of the opinion, after 24 years of experience, that hysterectomy was, in cases where cancer might be suspected, the only safe procedure, and for a large proportion of the remainder, the only form of treatment likely to restore the patient to normal comfort and health. He had performed this operation in 201 of the 292 cases. Adnexal disease and other causes of pain and tenderness existed in all but 25 of the 201 cases. At the Bradford Royal Infirmary, he stated, radium was not available. The general practitioners, who had the opportunities of seeing the effects of treatment over long periods, were apparently satisfied with the results of hysterectomy and often asked that the surgeon should make a "clean sweep."

Discussion.

Prof. WATSON said that attention should be concentrated on the diagnosis of the cause of the bleeding, and it was important to get a clear history as to whether the type of bleeding was a menorrhagia or a metrorrhagia. In the latter case there were probably associated symptoms such as backache. He recommended a careful bimanual examination under anæsthesia and also diagnostic curettage with thorough examination of all the curettings which should determine whether cancer was present or not. His line of treatment was as follows: (1) If the uterus was not enlarged and no associated disease of the adnexa—radium. (2) Uterus large with associated disease of appendages—hysterectomy. (3) Prolapse of uterus associated with bleeding—Mayo's operation.

Dr. J. J. BELL (Bradford) disagreed with Mr. Phillips, as in his experience a large number of these cases could be cured without radical operation. He had for some time watched the effect of radium and was convinced that cases which did not show gross pathological changes could be controlled and cured by inserting 50 mg. of radium for 10 to 12 hours. Such patients did very well, and felt that they had not lost an important organ. Even if there was any hidden source of cancer cells they would be destroyed by the action of the radium.

The CHAIRMAN agreed with Prof. Watson as to the importance of a thorough investigation. He believed in examination under anæsthesia and preferred to get his gloved finger into the uterine cavity. Should there be no evidence of malignancy or a polypus the case probably came under the category of a chronic metritis, for which radium had proved to be an unqualified success. In cases of malignant disease of the uterus he firmly believed in the use of radium prior to operation.

Dr. GORDON LUKER (London) said he usually advised hysterectomy in all cases where the uterus was enlarged, where there was associated diseases of the adnexa or chronic cervicitis; also if curettings were at all suspicious of malignancy.

Prof. MILES PHILLIPS said that in cases of chronic metritis or subinvolution a dose of 2000 "millicurie" hours would stop all future hæmorrhage. His custom was to make a diagnostic bimanual examination under anæsthesia, having previously obtained permission to perform a hysterectomy if necessary. Should there be no evidence of malignancy or diseased appendages, he in that case inserted radium. He believed that chronic lesions of the cervix were really pre-cancerous.

Prof. MILES PHILLIPS read a paper on the

Advisability of the Routine Pelvic Examination During the Puerperium.

He wished to focus attention on the value of a routine postnatal examination of women. Antenatal work had quite rightly attracted attention, but he had found that very few practitioners made an examination following parturition. He had done so for the past 20 years, and usually performed this examination on the twelfth day of the puerperium. An anæsthetic was not necessary, but the bowels and bladder should be emptied. He advocated not only a careful digital and bimanual examination but also a thorough inspection of the vagina and cervix with the aid of a Sims speculum. Tears in the vagina and cervix were looked for and any granulation tissue or polypi were snipped with scissors and afterwards cauterised with pure carbolic acid. These measures quickly effected a cure. If the cervical canal was patulous and admitted the index finger—normally it should not on the twelfth day—a digital exploration of the uterus was made, followed by intra-uterine irrigation and swabbing. If there was any subinvolution of the pelvic floor or vagina this was noted and treated by longer rest, &c. A retroverted uterus should be replaced and a broad Hodge pessary inserted, which not infrequently effected a permanent cure. He maintained that this routine examination in the puerperium was necessary. All knew that many gynæcological diseases arose from the wear and tear of parturition, and a routine examination in the puerperium was the best method of discovering the early beginnings of these troubles. He laid great stress on the fact that chronic cervicitis was often due to an infection of a lacerated cervix and subsequent formation of granulation tissue and polypi in the angles of the tear; also that endometritis accompanied by defective cervical drainage was probably at the root of many cases of chronic subinvolution.

Dr. R. W. JOHNSTONE said the title of Prof. Phillips's paper had not led him to expect the description of such an elaborate method of examination as the writer appeared to practise. In the Edinburgh Maternity Hospital their practice was to examine all patients before they were discharged, generally about the tenth or twelfth day, but in private practice he preferred to postpone the examination until about the end of the third week. The routine examination involved merely inspection of the perineum, and bimanual examination to detect cervical tears and the position of the uterus. The speculum was never used unless there was some definite indication for it, and he confessed that he felt considerable dubiety as to the wisdom of introducing the finger into the uterine cavity, as Prof. Miles Phillips had described. With regard to retroversion of the uterus, it had been his practice, if he discovered a retroversion at the end of the third week, to leave the condition alone for another three weeks or a month, asking the patient to return at that time. In a large number of cases the displacement was found to have been spontaneously rectified at the end of six weeks, just as had been described in the contribution which the secretary had read. On the other hand, a retroversion was occasionally found to be present in patients at the end of six weeks which was not present at the end of three weeks. Rectification and introduction of a pessary at the end of six weeks still held out good hope of cure as the impetus to involution had not yet exhausted itself.

Prof. WATSON cordially agreed with Prof. Phillips, and said that he looked upon postnatal care as a form of preventive gynæcology. He had found that prolongation of the lochia was often an important symptom of retroversion; this condition often cleared up after replacement of the uterus followed by the insertion of a pessary.

Mr. W. W. KING (Sheffield) read a paper on the

Clinical Manifestations of Pelvic Adenomyoma,

based on his observations in 123 cases upon which he had operated. The growths occurred in the following positions: in the recto-vaginal space in 53 cases, the peritoneum in 26, the ovary in 23, the uterus in 17, and the tube in 4. The growths in the recto-vaginal space involved the rectum more or less extensively in about half the cases, and the utero-sacral ligaments were often infiltrated. The rectum was frequently adherent to the uterus. Peritoneal adenomyomata were characterised by scattered hæmorrhagic cysts; stellate scars upon the peritoneum were often seen and represented healed adenomyomatous implants. The ovarian growths were clinically recognisable by the presence of tar cysts which were frequently of large size, or as pin's head hæmorrhagic cysts upon the surface of the ovary. The uterine tumours of this type simulated unencapsulated fibromyomata. Tubal adenomyomata occurred as localised tumours in the uterine end of the tube. A study of the clinical symptoms showed that 16 per cent. of the cases had no symptoms referable to adenomyoma. In those with symptoms, abdominal pain of "shooting," "griping," or "aching" character was the most frequent complaint. The pain was often associated with vomiting. The other leading symptoms were dysmenorrhœa, rectal pain both at and apart from the periods, menorrhagia, and dyspareunia. The most conclusive physical sign in diagnosis was the presence of a tender retro-cervical ridge with hæmorrhagic cysts projecting into the posterior fornix of the vagina. The utero-sacral ligaments were frequently thickened and tender. An adherent retroversion, with rectal pain upon movement of the uterus, was found to be highly suggestive of adenomyoma. The ultimate results of the operation showed that hysterectomy with removal of the ovaries was the most certain cure, but that less radical operations were often followed by success.

Discussion.

Dr. JOHNSTONE said that he had had relatively a very small experience compared with Dr. King, having operated only on some few cases of adenomyoma of the uterus, as well as a number of cases of so-called chocolate cysts of the ovary. Doubtless he had overlooked many cases in which there were tiny puckered scars of the pelvic peritoneum which Dr. King regarded as of pathological importance. He agreed with Prof. Watson that the most suggestive symptoms were the onset of dysmenorrhœa in later sexual life, combined with menorrhagia, dyspareunia, and in many cases sterility. He would like to ask Mr. King whether he had any idea as to the likelihood of the tiny peritoneal adenomyomata which he had described undergoing spontaneous cure even in the absence of such radical treatment as he was disposed to recommend.

FRIDAY, JULY 25TH.

On the third day Dr. ALICE E. S. CLOW (Cheltenham) opened a discussion on

Dysmenorrhœa in Young Women; Its Incidence, Prevention, and Treatment.

Dr. Clow said that "dysmenorrhœa" was a word to which so many definitions had been given that it was necessary to state in what sense one was using the term. She said that menstruation was a function which, when normal, had no symptoms, and that suffering of any kind associated with this period was abnormal and was included in the term dysmenorrhœa, as used by her. To estimate the incidence of the condition, she had questioned, during the last 11 years, over 2000 healthy girls whose ages ranged from 12 to 22. Of these girls 1830 were at a secondary school and the remaining 220 were students at a training college for teachers. The result was as follows: Number of girls questioned, 2050. Group 1, normal, 78 per cent. Group 2, dysmenorrhœa: slight, 17 per cent.; subacute, 2 per cent.; disabling, 3 per cent.; total, 22 per cent. She had only recorded five cases of "spasmodic" dysmenorrhœa. She drew attention to the fact that her percentage of cases of dysmenorrhœa was much lower than that obtained by the two observers quoted by Blair Bell at the Congress of Obstetrics and Gynæcology last year. The change of school regimen with regard to exercise, and also to the lowering of the age of entrance, had steadily decreased the incidence of dysmenorrhœa. She hoped that it would soon be recognised that it was unnecessary for 22 per cent. of school girls to be subject to a monthly recurrence of pain. The speaker said she had known since her girlhood that normal menstruation was a painless function, and that not only could baths and exercise be continued with impunity throughout the normal period, but that by such a regimen dysmenorrhœa was usually relieved if not dispelled. During her first year of medical inspection at the school which supplied the data for this paper the rule was that games, gymnastics, and baths were discontinued during the first three days of the period. Those who felt inclined were allowed to go out for a walk, the others could lie down and read. In some of the boarding-houses the latter became the popular procedure, which resulted in an increasing number of girls not feeling well enough to continue the ordinary routine of school life. The practice of keeping girls in bed for one or two days during menstruation incurred not only a waste of time, but also was a source of future suffering.

It was her custom to question each girl at puberty as to her feelings and habits at the menstrual period, and having explained her own views advised the girl to put them into practice after consent from home had been obtained. The advice given corresponded to a leaflet issued by the Council of the Medical Schools Association. She then showed a table giving a summary of results obtained at the inquiry at the school and at the training college, and the main facts brought out by these two independent sets of figures were: (1) That the incidence of dysmenorrhœa had been reduced in each case, the reduction, over all, being approximately 75 per cent. (2) That there had been a decrease in the number of those who lay down during the period and a marked increase in the number who had warm baths and took their exercise as usual. (3) That the total incidence of dysmenorrhœa was less amongst the students than in the case of the school girls in spite of the fact that the former were all over the age of 18, when dysmenorrhœa was more common than in earlier girlhood. (4) There was a decrease in the number of cases of constipation. The speaker was sure that the practice of suddenly stopping all activity during the period was responsible for the relatively high proportion of cases of dysmenorrhœa among women of the educated class. She knew of no figures confirming hers in this country, but in America Miss Florence Meredith had recorded similar results. Dr. Clow was convinced that the best method of reducing incidence of this complaint would be to teach every school girl the simple rules of menstrual hygiene, and she suggested that the "Advice Leaflet" quoted above be distributed amongst the girls. It was also necessary to educate the mothers. It was her opinion that if dysmenorrhœa came to be regarded as a disqualifying complaint amongst female workers, many of the cases which could be cured by exercise would disappear and thus the chief source of inefficiency of the unmarried woman worker would be removed. She would like to suggest that schools and factories should provide private lavatory accommodation with facilities for washing, as the chafing caused by wearing the same sanitary towel often led to painful abrasions of the skin; these caused more suffering than the dysmenorrhœa itself.

Treatment.

Dr. Clow held that an operation should not be performed nor even suggested until a course of treatment by baths and exercise, with a judicious administration of drugs, had been tried for at least six months and found useless. Having excluded disease or any structural abnormality by routine examination, she advised the patient to take a hot bath at the commencement of the period and to continue it throughout. This gave relief even after the onset of the pain. Daily exercise should be taken some days before and throughout the period, and in the case of nervous girls it was necessary to prescribe a mild analgesia for the first three periods. It was exceptional to come across a girl whose dysmenorrhœa was not cured or much relieved by these means. The speaker had no collective results of the treatment of the severer cases of dysmenorrhœa among school girls; she had, however, obtained the subsequent histories of 100 consecutive cases of dysmenorrhœa in nulliparous women with no organic disease, who were better after being treated with baths and exercise. The results were as follows: 59 were cured (30 of these had, in addition, some drug treatment); 32 were relieved of pain, but were conscious of some discomfort (of these 22 were helped by drugs); 9 were no better; 6 did not give the treatment a trial; and 3 were relieved after a backward displacement of uterus was rectified. The drug most usually prescribed was ammonal; extracts of the ductless glands were not given unless there was some evidence of disorder of the endocrine system. The type known as "spasmodic dysmenorrhœa" was not so successfully dealt with by the above means; but she had never known a case of this type develop among the school or college girls who had continued their games throughout the period. This would suggest that the prevention of congestion during the early years of menstrual life was prophylactic also against spasmodic dysmenorrhœa. Dr. Clow was inclined to think that if all employers of female labour refused leave of absence for menstrual disability, the extra hardship endured by the few would be well compensated by the benefit conferred on the many.

Dr. MINNIE MADGSHON (London), medical officer, G.P.O., gave her experience of the incidence of dysmenorrhœa among female workers of the institution. She said there were roughly about 10,000 women employed in the Post Office, and although it was difficult to obtain reliable statistics, she estimated that the average time lost through dysmenorrhœa was one and a half days per officer per year; in addition the time spent in the sick-bay through temporary incapacity was two hours per officer per year. The above figures included women of all ages, but since 1911 a total of 2924 girl probationers aged between 14 and 15 years had been admitted to the Post Office. They were all examined on admission; of these 1823 were re-examined two years later and the incidence of dysmenorrhœa noted. It was found that on first examination 95 per cent. had no pain or pain without incapacity; on re-examination the figure was 93 per cent. For those requiring frequent rest the figures were 0·5 and 1 per cent. respectively.

Dr. LEONARD PHILLIPS (London) said he could not altogether agree with Dr. Clow's paper. He had for some time treated his cases on hygienic lines, but was convinced that there was a type of intractable dysmenorrhœa which could not be cured except by hysterectomy or radium. It was important to investigate each case thoroughly and to recognise the clinical type to which it belonged. As a consultant he saw many cases of disabling dysmenorrhœa which were sent to him after other treatment had failed, and he wished that baths and exercises would cure these cases. The best results from treatment were obtained between the ages of 16 and 20; after 30 most cases were intractable. When cases that could be cured by drugs, operative means, and attention to hygiene were excluded there remained the "uncurable" cases. For these he recommended radium, and after cessation of the period the pain disappeared.

Dr. CATHERINE CHISHOLM (Manchester) said that she had adopted Dr. Clow's line of treatment for some years with good results. She believed in routine games and exercises for healthy girls, but pale and anæmic girls who lost profusely at the periods should have their general physical condition improved before undertaking exercises. There was also another group in which fatigue—both physical and mental—increased dysmenorrhœa, and in these cases prophylactic exercises should be ordered with reservation.

Dr. RHODA ADAMSON gave her experience of cases which were drawn from (1) private practice, (2) students, and (3) 4000 women who were engaged at engineering works during the war. The first two classes came under the heading of those who led an unhygienic type of life, and most of these cases were improved by baths, exercise, and attention to the bowels; the others could be cured by diathermy, and she entirely disagreed with Dr. Phillips that any cases were incurable. She had no records of the third class, but practically none of these women suffered from dysmenorrhœa, except those who were sitting down all day. When heavier work was substituted the pain immediately disappeared. In conclusion, she said she would like to congratulate Dr. Clow on the reasonable treatment she advocated.

Mr. BOURNE said he thought the work of medical women most valuable, especially with regard to their investigations into the incidence of dysmenorrhœa. It was only since they had studied this subject that we had any clear conception of this important point. As a gynæcologist, however, he was convinced there was a pathological type which was represented in Dr. Clow's table by the 3 per cent. suffering from disabling dysmenorrhœa. He was in favour of the propaganda advocated by Dr. Clow for the 97 per cent., but wanted to know how to cure the remaining 3 per cent. He emphatically disagreed with Dr. Rhoda Adamson, who did not believe that any case was incurable.

Dr. W. A. POTTS (Birmingham) asked if Dr. Clow made any rules about sea-bathing; also if she found the mentality, as expressed in fits of bad temper, &c., was affected by menstruation. In those cases where hygiene and physical treatment failed he would like to put in a plea for psychological treatment carried out by a psychologist and continued for a sufficient length of time. All necessary physical treatment should be carried out first, he said, but when that had been done it should be realised what a serious step it was to operate where pain was the only symptom.

Sir MALCOLM WATSON (Klang, F.M.S.) said that he practised in the Malay States, where the average daily temperature was 90° F., and had found that in these regions the men who took plenty of exercise were the fittest. He had therefore decided, since hearing Dr. Clow's paper, to recommend baths and exercises for the treatment of dysmenorrhœa amongst the European women out there.

Several other speakers took part in the discussion.

The PRESIDENT, after congratulating the meeting on the excellence of the discussion, thanked the various women doctors for their valuable contributions of data obtained from schools, training colleges, and other institutions, and said that it was only by this means one was able to get a comparison with the normal, as the majority of cases seen by gynæcologists were abnormal.

Dr. CLOW, replying briefly, stated that she had never known any harm result from girls taking cold baths during menstruation. She could not definitely say whether the mentality was affected, but housemistresses had noticed that some girls were occasionally depressed at this time.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

WEDNESDAY, JULY 23RD.

THIS section met on three days, with Dr. THOMAS GRAINGER STEWART, the President, in the chair. The first day of meeting was devoted to a discussion on

Certification in Mental Disorders from the Medical and Social Aspects.

The PRESIDENT, in his introductory address, said that the officers of the section had endeavoured to choose for discussion subjects of interest to the general practitioner as well as to the specialist. Recently the process of certification in mental disorders had been widely commented upon in the lay press and, he feared, had been somewhat misrepresented; in this matter the laity had an erroneous idea as to the exact function fulfilled by the medical practitioner. The question before the practitioner's mind should invariably be "What is best for the patient?" If certification as at present carried out was not the best that could be done, what alternatives could be devised?

The opening paper of the discussion was then read by Dr. H. YELLOWLEES (The Retreat, York), who began by pointing out that the statutory certificate dealt essentially with the patient's social relations rather than with his medical state, and was primarily concerned with his fitness "to be taken charge of and detained" and not with his unsoundness of mind. The fact that the Lunacy Act was only interested in mental disease if and when it rendered a patient fit for detention had an all-important bearing on the course the practitioner must adopt when writing a certificate. The word "detention" signified an interference with personal liberty; no consideration was given to the fact that an appreciable number of certified patients were not only willing but anxious to stay under care and treatment. Lunacy legislation was so obsessed with the idea of safeguarding personal liberty that it ignored almost completely the facts that the insane were ill, that their illness often prevented their knowing what was best for them, and that the opinion most likely to be of value on the point was that of a competent medical man. Dr. Yellowlees then proceeded to comment upon the process of presenting the petition and the signing of the reception order. In his opinion, the latter was the weakest part of the system of certification. Many specially appointed justices of the peace and magistrates—as distinct from county court judges—although actuated by a sincere desire for the public good, were often ignorant of the detailed requirements of the lunacy law. Several instances of mistakes resulting from such lack of knowledge were cited. As regards the certificate from the certifying physician's standpoint, the law was not satisfied with a mere statement of his conclusions; it insisted that he should set forth the "facts indicating insanity." The physician, therefore, was not made the sole judge of the patient's insanity; he placed the observed facts on which his opinion rested before the representative of the law, who had every right to draw a different conclusion from them if he felt so disposed.

Dr. Yellowlees contrasted the procedure of certification in England with that obtaining in Scotland; under the law of the latter the petition and the certificates were laid before the sheriff, a trained legal official, who issued the order for the patient's detention. This is one of the explanations of the comparative immunity from legal trouble in mental work in Scotland. Concerning borderland cases, Dr. Yellowlees feared that the public was being misled on the subject. Generally speaking, a true borderland case did not become insane, a mild or incipient case was by no means necessarily a curable one, and the acute, recent, recoverable cases were, on the whole, far more abnormal in conduct and required far more specially skilled care than the permanently and hopelessly insane. Unfortunately, the opposite view was held by and was being taught to the general public.

Discussion.

Dr. G. W. B. James (Moorcroft House, Hillingdon) suggested clinical points which might usefully be borne in mind when certification was in question. First, an important consideration was the degree of insight the patient had into his own condition. Did he realise he was ill? With a fair degree of insight it might be possible to avoid certification in a private patient and have him admitted to a mental hospital as a voluntary boarder. Secondly, the question of suicidal impulses arose. When a patient showed evidence of being actively suicidal certification was the wisest course. At the same time, however, Dr. James believed it impossible as a general rule to certify a patient who intended to commit suicide unless there was other evidence of mental disorder. Thirdly, there was the question of danger to others. Ideas of persecution were danger-signals. Many men lived harmless lives with vague ideas of persecution, but the patient who disclosed a firmly crystallised belief that he was being persecuted by a specific individual was a danger. Marital suspicions occurring in chronic alcoholics and senile disorders were also a certain menace to the safety of the family and the public. Dr. James then dealt with the surprising paradox that a patient duly certified could legally refuse the treatment considered necessary; a case of meningo-vascular cerebral syphilis—with a good prognosis from energetic anti-syphilitic treatment—was mentioned as an example.

Dr. J. H. Thornley (Scarborough) spoke from the standpoint of the general practitioner. He considered that more onus was thrust upon the practitioner than was justified, and entered a plea for the appointment of a State mental expert to sign and endorse certificates supporting the medical opinion that a particular patient was of unsound mind. Such a mental expert should also be available for consultation in the same way as the medical officer of health gave an opinion in the case of infectious disease. Dr. Thornley also advocated a form of temporary "detention" for mild and borderland cases.

Dr. Stanford Read (London) differentiated between "insanity" and "unsoundness of mind," the former being a legal term involving the necessity for control. In certification the facts indicating insanity were highly debatable, and without a knowledge of psychopathology a medical man might commit a patient in whose case no such step was required. Thus, symptoms such as depression or suicidal ideas might be taken at an incorrect value. He agreed with Dr. Thornley that it would be ideal in every local area to have an expert in mental diseases who would be either responsible for certification or be a co-signatory with the medical practitioner. The stigma attached to insanity was deeply rooted and was only increased by medical men speaking of "nervous breakdown" when the word "mental" should be used. The public should be educated in and familiarised with all the factors of mental hygiene; this was the only way in which the stigma could gradually be removed. Dr. Stanford Read instanced the town of Gheel, in Belgium, where over a thousand certified patients are housed with the population, a system that has been in force for hundreds of years. As a result, there has developed in this town such familiarity with insanity that it is viewed in a light very different from the usual, and the stigma has sunk into insignificance.

Dr. J. I. Russell (North Riding Mental Hospital) said that by our present tendency to advise the institution of treatment centres for mental disorders in general hospitals—situated in traffic and without verandahs, gardens, &c.—we encouraged the prejudice against mental hospitals. We should rather do all in our power to elevate the mental hospital and to advocate a modified form of certification; patients would then be received earlier and the suicide of many incipient cases prevented. He considered that the same procedure of certification should apply to private and rate-aided patients alike, and that the relative of the latter should have the same rights as the petitioner in the case of private patients.

Dr. Bedford Pierce (Leeds) urged the facilitation in every possible way of the treatment of patients as voluntary boarders; the system should also apply in public mental hospitals. He supported the plea for temporary detention without certification in recent acute cases, and advocated the appointment of a legal referee in each district empowered to call in expert advice in difficult cases. The responsibility of initiating treatment should lie with the medical practitioner, but, at the same time, he should be given effective protection; the patient, however, should have the right, if aggrieved, to appeal to the legal referee.

Dr. J. Mills (Galway) expressed his agreement with the chief points in the reforms suggested by Dr. Bedford Pierce. He added that, in his opinion, the most urgent reform was needed in the regulations governing the so-called "pauper" patients; this class should be admissible to district mental hospitals on the same conditions as voluntary boarders were admitted to private institutions. Dr. Mills recalled instances of such cases suffering from incipient insanity coming to him to ask for admission to the mental hospital; under the law he was forced to refuse. He also suggested that a form of temporary detention on the certificate of a specially appointed medical referee would assist in giving confidence in mental hospitals to the general public.

Dr. Hildred Carlill (London) mentioned the difficulty experienced in stating the "facts observed indicating insanity" in some cases of mental disorder, and gave an instance.

Dr. D. Blair (Lancaster) said that it was unfair to the family physician to have the whole onus of certification thrust upon him; he considered that every patient should be certified by two medical men—one a specially appointed expert in mental disorder and the other the patient's usual medical attendant.

Dr. C. Worster-Drought (London) dealt further with the fact that a patient certified as of unsound mind can still legally refuse treatment; this fact was not generally known, but was of particular importance in the case of the treatment of cases of neurosyphilis by intravenous or intrathecal injection, of G.P.I. by malarial infection, and even for the performance of lumbar puncture. Consequently certification as of unsound mind did not imply compulsory treatment. He also mentioned the difficult question of the advisability of certifying solely on definite suicidal impulses, and cited instances. A further plea was entered for the treatment of mild or early cases of mental disorder occurring in those who were unable to afford a private mental hospital either as voluntary boarders in public mental hospitals or in special institutions; it was pointed out as a defect in our social system that there was no institution between the general hospital and county asylum for the reception of such cases. Dr. Worster-Drought also drew attention to the fact that often in the actual practice of Section 13 of the Lunacy Act the relieving officer's opinion of the patient's mental state is the most important factor.

Thursday, July 24th.

On the second day the proceedings were devoted to a discussion on the

Nature and Treatment of Epilepsy.

Dr. James Collier (London), in opening the discussion, stated that investigations during recent years had brought no great discoveries fundamentally to alter our view concerning the nature and treatment of epilepsy; nevertheless, some progress had been made towards creating a wider conception of the disease and the bringing into line of those conditions in which the manifestations resembled or were identical with those of the malady which we termed "idiopathic epilepsy." There had also been some useful work done in the separation of certain clinical types of epilepsy—pyknolepsy, myoclonus epilepsy, affect epilepsy—and also at least one valuable addition to our therapeutic measures for its treatment. As regards the nature of epilepsy, Dr. Collier considered that it was not in any sense a disease of the brain, but that there was much evidence in favour of its resulting from a form of metabolic disturbance. He also cited other conditions of known metabolic dyscrasia in which epileptiform convulsions occurred —e.g., uræmia and eclampsia—while in his opinion infantile convulsions were epileptic in nature and were similarly produced. Among the points in favour of a metabolic disturbance were the periodicity of the attacks, the resemblance of status epilepticus to an acute toxic process, the immunity of the epileptics from so many common diseases, the constant leucocytosis with increase at the time of the paroxysm, the diminished blood alkalinity both before and after the attack, and the presence of choline in the cerebrospinal fluid of some epileptics. There was very little evidence in favour of an endocrine disturbance as responsible for the manifestations of epilepsy, while in his experience protein therapy—on the ground that the cause of the seizure was "anaphylactic shock"—did not yield any convincing results. From the irregularity of the incidence of epilepsy in lesions of the brain, Dr. Collier considered that it was not the lesion itself which caused the epilepsy, and that it was due to some associated condition not necessarily present with every lesion. As regards traumatic epilepsy, he had never seen a case benefited by operation and considered that operative measures were allowable only when indicated by definite physical signs other than the epilepsy.

The speaker then referred to the treatment of epilepsy. His experiences had convinced him that the less one departed from the routine of a normal healthy life and the fewer restrictions one made, the better it was for the patient. In children the ordinary course of education, discipline, games, and pleasures should be continued. Occupation was good for every epileptic. As regards dietetic treatment—such as the exclusion of meat—he considered that it did not appear to have any effect upon the course of epilepsy; as a general rule, alcohol should be forbidden. With the single exception of suppuration within the temporal bone, he believed that local bodily troubles—dyspepsia, constipation, uterine disorders—were of no importance either as causal factors or as excitants of the attack. In children who showed degrees of infantilism, backwardness, cerebral diplegia, and also in those with a low basic metabolic index, thyroid extract was sometimes a valuable adjunct in the treatment; in other cases, however, it might be harmful. Dr. Collier strongly condemned the view that medicinal measures should not be used in epilepsy until all other hygienic-dietetic measures had failed, and followed Gowers in the conviction that "apart from general regimen for the maintenance of good health, the treatment of epilepsy was purely medicinal." He believed that the remedies in common use acted rather by influencing the metabolic dyscrasia than by lowering the excitability of the nervous system. The method of treatment favoured was the giving of the remedy in a single dose at night in nocturnal epilepsy, in the morning in diurnal epilepsy, and both night and morning when the attacks occurred both day and night; he preferred not more than 1½ gr. of luminal as the morning remedy, and not more than 25 gr. of bromide at night.

Discussion.

Dr. ALDREN TURNER (London) said he was uncertain that all types of "idiopathic" epilepsy resulted from a metabolic dyscrasia, although he agreed that those cases which followed the exanthemata or other infective disorders probably resulted from this cause. Concerning an endocrine disturbance as a causative factor he was sceptical; the whole subject required fuller investigation. He considered that there was evidence that in a small group of epilepsies the disease was anaphylactic in nature and submitted that the undoubted value of a purin-free diet occasionally in epilepsy might be explained on this hypothesis. Dr. Turner's conception of epilepsy was that of "a morbid state characterised by periodic reactions of a very striking kind, and in the majority of cases tending towards chronicity and the development of some degree of mental enfeeblement." Research tended to limit the number of cases of idiopathic epilepsy and to place them in either the organic, the toxi-infective, the psychogenic, or the temperamental group. He believed that there was no doubt that some cases were purely psychogenic in origin.

Dr. TYLOR FOX (Lingfield) dealt with the use of luminal in epilepsy. He very rarely gave more than 2 gr. a day, as with larger doses—and sometimes even with 2 gr.—he had seen scarlatiniform rashes, symptoms of depression, and a dazed condition develop. He considered that with prolonged use luminal undoubtedly lost some of its effect; it was during the first two or three months of giving the drug that the most favourable results were obtained. The dosage, therefore, should be kept small and it should not be stopped suddenly or a marked increase in the frequency of fits would result. Emotional factors were of great importance in the determination of the attack; if the patient's environment was distasteful the fits were numerous, whereas when things were going well the fits were few. Environment was also of importance owing to the inability of the epileptic to adapt himself to the changing conditions of every-day life under which he was regarded as abnormal. Herein lay the case for colony treatment; in a colony the epileptic saw himself as a normal member of the community in which he lived. At Lingfield Colony over 20 per cent. of children lost their fits.

Dr. A. MCDOUGALL (David Lewis Colony) said that as in the majority of cases the epilepsy would persist throughout life, the physician should aim at preventing the patient from acquiring the unpleasant characteristics usually found in chronic epileptics. Every child developing epilepsy should be removed at once to a residential epileptic school. Witnessing attacks in other patients did not render an epileptic any more likely to have an attack himself; on the contrary, familiarity with the sight of fits often encouraged the patient to consider himself less afflicted than his neighbours.

Dr. STANFORD READ said that in his opinion the conception of epilepsy had been too narrow, because it had been regarded as a disease-entity instead of an end-result of some morbid process; because the convulsion itself had been the main source of interest with consequent neglect of the study of the individual in the inter-paroxysmal period; and lastly, because the psychic factor had not been adequately taken into account. Idiopathic epilepsy was just as much symptomatic as any other form, only the pathological basis was unknown. It was helpful to regard the nervous system as a mass of inter-related reflexes with any number of incoming stimuli and correspondingly manifold outward activities. Then we could see that a healthy organism was able through its nervous system so to distribute the energy received as to bring about a series of harmoniously adjusted activities. If, too, we viewed our nervous system as having evolutionary levels—physico-chemical, physiological, psychological—we might surmise that at any of them there might be, through disease, some block in energy distribution and discharge with resulting pent-up tension, which finally found its outlet in a convulsive attack. Many psycho-pathologists saw evidence at the psychological level of a blocking, pent-up tension, and sudden energic discharge in certain types of epilepsy. The study of the fit itself could not with any certainty differentiate for us the fit due to organic disease from one due to psychogenic causes. An investigation of the epileptic revealed in the majority of cases a lack of psychic balance which could not be regarded as secondary and something apart from the disease itself. Pierce Clark's painstaking work had taught us much on this point. The epochs of special physiological stress which not infrequently were productive of epilepsy were also commonly periods of psychic stress. Those untrained in psychological medicine did not elicit this latter factor and therefore denied its existence, or if noted they did not assess it correctly. Sadger and Stekel had published analytic investigations, and the latter stated he had had excellent therapeutic results. Dr. Stanford Read described a case of "grand mal" in which the history led one to suppose that psychogenic causes existed and where psychotherapy had certainly brought great benefit. A plea was made for a more detailed psychological study of those cases of epilepsy in which patent organic causes could not be demonstrated.

Dr. D. H. HARDCASTLE (London) considered that the essential reaction in epilepsy was a break in consciousness, which constituted a regression to a pre-conscious psychological level. He postulated a corollary between the epileptic fit and the "mass-reaction" dependent upon insufficient integration between the higher psychological and the lower physiological levels. Treatment, he considered, should be directed towards endeavouring to educate the child to adapt himself to his surroundings and to increase imperception.

The PRESIDENT expressed his belief that the ultimate cause of epilepsy might eventually be found to concern the sympathetic nervous system. He described a case of epilepsy associated with vagotonia which had apparently been cured by atropine. The vegetative nervous system, he considered, might over-react on either the sympathetic or the parasympathetic side.

Dr. W. A. POTTS (Birmingham) advocated the application of psychological treatment in epilepsy as early as possible. He had seen several cases, in which an important psychological basis existed, fail to improve with psychotherapy, either because a long period had elapsed since the disorder first appeared, or because the patient was unwilling to persevere with the treatment.

Dr. CARLILL raised the question of marriage in epileptics and drew attention to the precautions that should be taken by epileptics with regard to the risk of accidents. He also pleaded for greater accuracy in the diagnosis of epilepsy.

Dr. WORSTER-DROUGHT agreed with the opener that in many cass of epilepsy the probable basis was some form of metabolic disorder. Other facts not previously mentioned that supported this view were the frequent presence of a positive Widal, the hæmoclasic reaction for hepatic insufficiency and the "dysregulatio ammoniaci" of Danish observers. In the theory that epilepsy was due to food-protein idiosyncrasy and the reaction an anaphylactic state, Dr. Worster-Drought had very little belief. A series of cutaneous reactions with extracts of common foods, carried out on 40 cases of epilepsy, had not yielded a single positive result. He expressed surprise at Dr. Collier's experience of never having seen a case of traumatic epilepsy benefit by operation, as he (Dr. Worster-Drought) had met with several not only benefited but apparently cured by operation. He described two cases of non-penetrating injury in which operation had led to a complete cessation of the attacks. Regarding the treatment of epilepsy, his most favourable results had been obtained with combinations of luminal and sodium bromide. To illustrate this, he gave an analysis of 80 cases treated by different methods—simple bromide, borax and bromide, luminal, luminal and sodium bromide, intravenous injections of colloidal palladium, and dialacetin. He also agreed with other speakers that small doses of luminal were preferable—not more than 4½ gr. per diem.

Dr. J. W. SCHARFF (Singapore) considered that colony treatment tended to place a stigma upon the patient and believed that a better end-result could be achieved at home.

Dr. D. E. CORE (Manchester) raised the question of the frequency of death occurring in nocturnal epilepsy from the patient turning over and being suffocated by the pillow.

Dr. COLLIER then replied briefly to the various points raised.

FRIDAY, JULY 25TH.

The proceedings on the third day opened with a demonstration, by Dr. F. C. EVE (Hull), of the

Measurement of Kernig's Sign by Means of a Wheel Goniometer.

The defect in the ordinary method of eliciting Kernig's sign was that so much depended upon the amount of force used by the operator; hence it was often equivocal and could not be measured. When, however, the patient's leg was raised from the bed with the physician's hand placed just below the middle of the tibia, a time came when the knee flexed spontaneously. The angle which the leg then made with the horizontal was measurable by means of the wheel goniometer, an apparatus consisting of a spindle carrying a small graduated wheel which was weighted so that the 90° mark always floated uppermost.

Dr. A. FEILING (London) then opened a discussion on the

Differential Diagnosis and Treatment of Compression Paraplegia.

In order to keep the discussion within reasonable limits, Dr. Feiling excluded from consideration all cases of sudden or acute lesions of the spinal cord caused by trauma or acute myelitis of any kind. After a consideration of the physiological disturbances and pathological changes that followed compression of the spinal cord, he classified the causes of this form of paraplegia under two main headings: (1) extrathecal lesions, and (2) intrathecal lesions. Among the extrathecal lesions were the various diseases of the vertebræ, including caries, tumours, and spondylitis, and such conditions as aortic aneurysm, parasitic cysts, and tumours arising in the perithecal tissues. The intrathecal lesions included extramedullary and intramedullary tumours and the different forms of chronic meningitis. The general signs and symptoms were considered under two headings: first, those due to the direct effect of the lesion on the spinal cord and nerve-roots at some particular level (local symptoms); and secondly, those due to the interruption of the functions of the long tracts running in the cord (remote symptoms). The local symptoms included pain—localised to the area of supply of the nerve-roots involved—hyperæsthesia, and later, anæsthesia, while the remote symptoms were: (1) Motor—some degree of loss of voluntary power with spasticity and alterations in the reflexes; (2) sensory disturbances—developing later than the motor symptoms and appearing first in the feet and legs; and (3) affections of the autonomic system, especially in relation to the bladder and rectum, vasomotor changes, trophic lesions, and abnormalities of sweat secretion. Dr. Feiling then proceeded to describe the particular features of two of the most important and commonest forms of compression paraplegia—Pott's disease (about 5 per cent. of which cases showed spinal cord symptoms) and the paraplegia due to spinal tumours arising within the dural envelope. In spinal caries the cord might be injured in one of several ways—e.g., by pressure from an abscess, by tuberculous granulation tissue interfering with the circulation in the cord, by chronic pachymeningitis, and finally, very rarely by direct pressure from a displaced fragment of bone. The commonest form of spinal cord tumour was the intrathecal and extramedullary tumour, which arose inside the dural envelope often in connexion with a nerve-root, and exerted pressure on the cord over a particular segment or segments. This was a lesion which was essentially amenable to cure by surgery, provided the diagnosis had been made sufficiently early. The clinical picture of these extramedullary tumours was that of a slowly progressive paraplegia with clearly defined sensory loss, often preceded or accompanied by root symptoms and not infrequently with a tendency to the development of the Brown-Séquard syndrome. Certain diseases might simulate a compression paraplegia very closely; these were spinal syphilis, disseminated sclerosis, and syringomyelia. Examination of the blood and cerebro-spinal fluid would assist in excluding syphilitic meningomyelitis, but it may be mentioned that a positive Wassermann reaction in the blood does not negative a spinal tumour, and a positive reaction in the cerebrospinal fluid had been found in some cases of spinal cord tumour.

An X ray examination of the spine was essential, he said, in all cases in which compression paraplegia was suspected, and the cerebro-spinal fluid must also be investigated. The changes occurring in the cerebrospinal fluid in compression of the spinal cord often afforded conclusive evidence of a block in the free circulation of the fluid in the subarachnoid space. The fluid withdrawn by lumbar puncture might show excess of albumin without any excess of cells (" dissociation albuminocytologique ") or a Froin syndrome—viz.. the cerebro-spinal fluid coloured yellow (xanthochromia) and coagulating spontaneously on standing. The injection of lipiodol (a vegetable oil containing 40 per cent. of iodine and opaque to X rays) into the subarachnoid space at the cisterna magna with subsequent radiographic examination—a method recently introduced by Sicard—was a useful method of determining the site of the lesion. The lipiodol was heavy and tended to sink towards the bottom of the theca; if a block were present the substance was arrested at the upper limit of the obstruction.

Discussion.

Dr. **Carlill**, supplementing the opening paper with remarks from his own experience, pointed out that the site of a compressing lesion at certain levels could be determined by the attitude of the patient, and showed a photograph of a man with the attitude characteristic of a lesion just below the sixth cervical segment. He gave illustrations of the occurrence of priapism, with lesions not only in the cervical cord but in the dorsal and lumbar regions, and showed a photograph of a very large bedsore which had healed. Dr. Carlill next described a case in which cerebro-spinal fever led to compression paraplegia; meningitis circumscripta serosa was diagnosed and the diagnosis was supported by the failure of fluid to flow on lumbar puncture. This was confirmed by lipiodol, which showed complete obstruction in the subarachnoid channel, and proved by laminectomy. He also pointed out that to use lipiodol above a lesion it was not necessary to puncture the cisterna; the injection could be made into the cervical or dorsal theca provided the lesion was not high in the cervical region. Two other cases were quoted in which he had failed to obtain fluid by lumbar puncture, one of pineal cyst and the other following tetanus. He concluded by giving reasons for his belief that thecal puncture for diagnosis was an operation for the expert alone. The information it afforded at the time and in the laboratory made it the most important single operation in medicine.

Dr. J. **le F. Burrow** (Leeds) emphasised the occurrence of spinal rigidity in cases of spinal cord tumour and showed a case in which an extramedullary spinal tumour had been successfully removed. He considered the sensory examination of the utmost importance and advocated the use of Head's algesiometer for the purpose; small qualitative and quantitative changes in sensation were of great value in diagnosis. Cases of spinal caries in which paraplegia developed with great rapidity were instanced by Dr. Burrow, and he mentioned cases of paraplegia following slowly upon a slight trauma; knowledge of their pathology was slight. He agreed with the opener that a positive Wassermann reaction was occasionally found in the cerebro-spinal fluid from cases of spinal tumour—in highly albuminous fluids almost certainly non-specific. With regard to lipiodol, he was not in favour of its employment excepting in a few very difficult cases; he had seen retention of urine follow its use and the substance was difficult to handle.

Mr. G. **Jefferson** (Manchester) referred to the changes in the cerebro-spinal fluid and expressed his opinion that Froin's syndrome was very rare. Increased venous pressure (e.g., produced by compressing the jugular vein), he pointed out, normally caused a rise in the cerebro-spinal fluid pressure; if on lumbar puncture this normal rise was found to be delayed or absent (tested by means of a manometer), it afforded some evidence of a block being present in the intrathecal canal above the site of puncture. He drew attention to the fact that lipiodol was not so heavy as generally supposed, and that Sicard himself advocated waiting an hour after the injection before the X ray examination in order to admit of better gravitation. With reference to spinal caries, Mr. Jefferson said the incidence of paraplegia was about 5 per cent. of cases, although the actual condition is on the decline owing to the more efficient modern treatment of spinal tuberculosis. The chief argument against laminectomy was that 80 per cent. of cases recovered the use of the limbs with immobilisation treatment alone. If the paraplegia was stationary or increasing, laminectomy should be considered; operation was most likely to benefit when abscesses were present in the vertebral canal, and less likely when the paraplegia was due to pachymeningitis.

The **President** dealt with some of the surgical aspects of compression paraplegia and particularly with that form due to intrathecal tumour. He said that the most frequent position for such a tumour was between the anterior and posterior spinal nerve roots, being attached to one or the other. The effects of such a tumour were purely mechanical and typical in onset; as soon as the tumour became sufficiently large it would tend to compress the adjacent lateral column of the cord and eventually give rise to a Brown-Séquard type of syndrome. The first symptom was usually spontaneous " jumping " of the leg at night, followed in turn by occasional " giving way," dragging, and finally some degree of paralysis of the limb. The deep reflexes of the leg would then be increased, the plantar reflex extensor or indefinite, and the abdominal reflex of the same side reduced. Later would be found some loss of sensibility to heat and cold in the opposite leg extending upwards to within three or four segments of the actual level of the lesion. Such tumours were easily removed and the results of operation excellent. Concerning Pott's disease, if there was a flaccid paraplegia present that was not recovering, operation should be undertaken. In pachymeningitis root pains were usually present as well as muscular spinal rigidity. The most rapidly fatal cases of compression paraplegia were those due to sarcoma, while the most frequent secondary deposits involving the spinal cord were from growths arising in the kidney and suprarenal gland—more frequent than from the stomach.

Dr. **Worster-Drought** spoke of the difficulty in differential diagnosis in many cases of lesion in the lower cervical region of the spinal cord. especially between (1) syringomyelia with local undissociated anæsthesia and " central " pain and a compression of the cord by tumour; (2) syringomyelia with Brown-Séquard syndrome and intramedullary tumour; and (3) a pure spinal type of disseminated sclerosis and an early compression paraplegia without sensory changes. In the latter instance the colloidal gold reaction in the cerebro-spinal fluid might be of assistance; in his experience, however, the spinal type of disseminated sclerosis was more likely to give a " luetic " type of curve than a " paretic." He also referred to cases illustrating the difficulties and the differential diagnosis. With regard to Dr. Carlill's suggestion of puncturing the theca in the dorsal region instead of the cisterna magna, Dr. Worster-Drought pointed out that such an operation was not devoid of risk; in a certain percentage of normal individuals the posterior subarachnoid space is deficient in the dorsal region, the spinal cord being adherent to the dura-arachnoid. Consequently, there was an increased risk of inserting the needle directly into the cord. Froin's syndrome he had seen most frequently in connexion with cerebro-spinal fever, and in his experience was rare in other forms of compression paraplegia.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of seven county boroughs for 1923:—

Name of county borough.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Leicester ..	239,700	19·2	11·6	1·1	1·3	1·9	38	84	3·5
Coventry ..	130,500	16·9	9·3	1·1	0·9	1·8	33	65	4·0
South Shields.	124,500	25·3	13·8	1·8	1·0	2·3	38	94	3·2
Walsall	100,400	23·3	11·7	1·1	1·0	2·0	45	94	1·7
Northampton.	93,230	17·8	11·6	1·1	1·5	2·2	31	57	4·2
Grimsby ..	85,620	22·9	10·5	1·2	1·4	1·9	34	79	4·1
W. Bromwich	77,600	24·2	12·5	0·8	0·9	3·3	36	88	2·7

Leicester.

Dr. C. Killick Millard says it is necessary to repeat again that shortage of housing accommodation is Leicester's most crying need. So far the housing committee have only been able to provide 766 new houses (up to March, 1924), while there are still 5600 applicants waiting. "So urgent and important," says Dr. Millard, "is this question of providing more working-class homes that it ought to take precedence over every other consideration." Another serious deficiency with much of the old cottage property in the central parts of Leicester is inadequate closet accommodation. For example, in Wyggeston ward out of 3117 houses inspected only 18·6 per cent. had their own W.C., while for 45·4 per cent. there were two houses to one W.C., and for 27·6 there were more than two houses to one W.C.; and in Newton ward out of 2024 houses inspected 20·4 had their own W.C., and for 45·5 per cent. there were two houses to one W.C., and for 34·2 there were more than two houses to 1 W.C. Dr. Millard considers the provision of extra W.C. accommodation for old property more important than any other improvement. Another defect in this class of property is the lack of adequate facility for washing clothes. Every new house has a washhouse outside or a copper in the scullery; but many of the old four-roomed cottages have neither. Dr. Millard points out that other towns provide municipal washhouses.

The question of the prevalence of goitre is discussed. Statistics based upon the medical inspection of school-children seem to suggest that there has been an increase in goitre since the early part of the century. There is no evidence, however, of any increase during the last four years. The percentage of girls in the secondary schools found to be suffering from enlargement of the thyroid during 1923 was 12·74 and the percentage of boys 2·75. A belief has been current in Leicester for several years that goitre has been more prevalent since the introduction of the Derwent water-supply, but inquiries made from other towns supplied from this source have not disclosed any increased prevalence of goitre, and the county medical officer of health for Derbyshire has pointed out that the Derwent watershed is not one of the districts of Derbyshire most affected by goitre. The prevention of goitre by small doses of potassium or sodium iodide is discussed, and it is pointed out that this method has been adopted in the schools of certain of the Swiss cantons for three years and that the extension of its use is recommended for all the schools in Switzerland.

Dr. Millard considers the evil effects of constipation, mentioning the belief by some that it is a predisposing cause of cancer. He suggests that instruction should be given to school-children in connexion with other health teaching with regard to this important matter. He thinks local education authorities might well act on the suggestion of the People's League of Health to have the lavatory accommodation of elementary schools thrown open to school-children before school hours. In view of the shortage of W.C. accommodation referred to above, this suggestion seems particularly applicable to parts of Leicester.

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Dr. E. H. Snell records his conviction that the deterioration of housing conditions goes on faster than improvements. The necessity for the carrying out of repairs is greater than it was before the war and yet the staff of inspectors has been cut down by two. Dr. Snell points out, on the other hand, that a neighbouring city, recognising the growing urgency of this work, has actually increased its staff of inspectors to meet the position. Owing to the increasing importance of cancer as a cause of death, Dr. Snell publishes in full the leaflet drawn up by the Royal Society of Medicine on this subject. He also discusses the parts of the body affected, the age-periods in which deaths have occurred, and the proportional rates in those age-groups during the last 12 years. When a comparison is made between the age-groups 55 to 65 and 65 to 75 for the years 1913 and 1923 respectively, it appears that the deaths from cancer have shown a greater increase than the population living at each of these two age-groups, while for the age-group 45 to 55 there is a slight decrease. Under the heading water-supply, the desirability of covering in the tank at Spon End is pointed out. This tank is liable to pollution by dust from the neighbouring streets, and the examination of samples indicates that the water in the tank is less pure than on its entrance from the wells. Dr. Snell points out the bad conditions existing in some of the houses let in lodgings, certain of them being used as common lodging-houses without the proper stringent supervision being applied. Before the war a special subcommittee recommended the provision of a municipal common lodging-house. Dr. Snell is of opinion that a municipal common lodging-house would meet a great need, that it should not be of a pretentious character, and that there is no reason why it should not be self-supporting. The usual re-inspection of all houses converted from "back-to-back" to "through-ventilated" houses showed that without exception these houses are still properly occupied as through-ventilated houses.

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South Shields.

Dr. William Nicoll states that the work embodied in the report was chiefly done under the supervision of his predecessor, Dr. Lyons. Numerous other alterations of staff took place during the year, the school medical service being most inconvenienced thereby. Dr. Nicoll says the high death-rate from tuberculosis is probably largely connected with the undesirable housing conditions which continue to prevail. Under the Housing Act of 1919 the council was authorised to build 1000 houses, but this number was subsequently reduced to 600. These 600 were completed during 1923 and comprise 305 houses of four rooms, 225 houses of five rooms, and 70 of six rooms. Dr. Nicoll is of opinion that there is a much greater demand for houses of two and three rooms to accommodate small families. Under existing conditions it is very difficult to get necessary repairs done. Overcrowding continues to get worse. As a direct consequence ash receptacles cannot contain the week's accumulation, and very many privies are quite unusable on several days of the week. During the year the council received permission to proceed with the erection of 290 houses under the Housing Act of 1923, and 130 of these were in course of erection at the end of the year. Lump sum grants of £100 per house to private builders under the 1923 Act have been also approved for 400 houses. Some figures are given from the Census for 1921. The density of population in South Shields is 48·6 persons per acre, the next highest borough in the county being Sunderland with 47·4. South Shields also contains the most densely overcrowded ward in the county—namely, Laygate, with a density of 206·8 persons per acre. South Shields again comes out worst in the county when judged by the Registrar-General's standard of the number of rooms per person available. The figure for South Shields is 0·71 room per person, Gateshead being a close second with 0·72, and the average for the whole county being 0·77. The proportion of the population overcrowded, in the sense of living more than two to a room, was shown to be 36 per cent. in the case of South Shields. The scheme for the conversion of the privies into w.c.'s has now begun in earnest and 1098 conversions were effected during the year.

Walsall.

Dr. James A. M. Clark states that the position as regards overcrowding has been but little relieved during the year, only 39 new municipal houses having been erected and 49 new houses by private enterprise. Only the bad cases of overcrowding could be dealt with, principally cases where single adult persons of opposite sexes were occupying the same bedrooms. A scheme for providing proper flushing cisterns for hand-flushed w.c.'s was in progress and was interrupted by the war. This scheme has gone slowly forward since the war, but in December last the health committee adopted the retrograde step of suspending this sanitary improvement. The combined Health and Baby Week in October was signalised by the opening of an extension of the open-air day-school, thus increasing its accommodation to 60. Dr. Clark reports a marked decline in rat infestation, many rat-infested buildings having been re-drained and others rendered rat-proof. The percentage of adulterated milk samples was very high, no less than 21 out of 99 samples being returned as adulterated. The penalties were not such as to act as deterrents; one case was fined 10s. and 10s. 6*d*. costs, 14 incurred costs of £1 each, five received cautions, and in one case the explanation was accepted. In his school report Dr. Clark states that the hygienic conditions of some of the older schools, both voluntary and council, are unsatisfactory, both lighting and ventilation being defective. He suggests that cheap improvement could be made by enlarging the window space.

Northampton.

Dr. J. Doig McCrindle gives some figures for Northampton from the Census. 19,893 structurally separate dwellings were occupied by 21,979 families. The size of the family was 4·45 persons in 1911 and 4·01 in 1921. The number of rooms per person was 1·27. The population living more than two to a room was 2393 in 1921 and 962 in 1911. Dr. McCrindle states that the drainage of many of the older buildings is defective and that the sewers in many districts are not self-cleansing and give rise to complaints with regard to sewer gas. In June the town council were asked by a resolution of a public meeting to adopt a model by-law for the compulsory use of "humane" methods of slaughtering. The butchers protested that there was no avoidable cruelty in the present methods, that the new instruments were not more efficacious, were not without danger, and that their use affected the quality of the meat. A deputation from the N.S.P.C.A. put forward statements controverting those of the butchers. Each side was asked to demonstrate its methods in actual practice. The demonstration took place early in 1924, and as a result the council decided to take no action for the present. Dr. McCrindle is of opinion that the provision and exclusive use of a public abattoir would be more effective in ensuring humane methods than any by-law. In November there was a small outbreak of anthrax cases in connexion with a tannery which handled skins from China. Some of the attacks were severe, but none were fatal. Dr. McCrindle discusses the prevalence of tuberculosis in the boot and shoe trade, and hopes to have more exact data when the later volumes of the Census are forthcoming. He shows that nearly half the mortality from tuberculosis of those engaged in occupations other than housework occurs among boot and shoe operatives.

Grimsby.

Dr. B. C. Stevens mentions that the system of purifying the water by chlorination has been adopted in the public swimming bath. A circular letter has been sent to the bakers and confectioners recommending that liquid whole egg should not be used for the making of sponge fingers, sponge biscuit, and small sponge cakes. Dr. Stevens refers to the great difficulty in educating or compelling rural milkers to be reasonably clean or to keep their cows reasonably clean.

West Bromwich.

Dr. R. Woolsey Stocks reports that Dr. Dorothy Unsworth has been appointed whole-time maternity and child welfare medical officer in lieu of the employment of four part-time general practitioners for this work. The change has resulted in an increased attendance. Dr. Stocks regrets the reduction of the staff of health visitors. Throughout the year there were only three health visitors at work, although, according to the latest standard of the Ministry of Health, the employment of six health visitors would be justified. In this connexion Dr. Stocks gives reason to think that although infant mortality is being reduced, there has been some increase in the mortality during the 1–5 age-period. Housing conditions remain very bad, and a large amount of the property is of such a poor character that no expenditure can make it satisfactory. In the report of the sanitary inspector we read that hitherto little action has been taken in West Bromwich as regards smoke abatement.

that such an operation was not devoid of risk; in a certain percentage of normal individuals the posterior subarachnoid space is deficient in the dorsal region, the spinal cord being adherent to the dura-arachnoid. Consequently, there was an increased risk of inserting the needle directly into the cord. Froin's syndrome he had seen most frequently in connexion with cerebro-spinal fever, and in his experience was rare in other forms of compression paraplegia.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of seven county boroughs for 1923:—

Name of county borough.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Leicester ..	239,700	19·2	11·6	1·1	1·3	1·9	38	84	3·5
Coventry ..	130,500	16·9	9·3	1·1	0·9	1·8	33	65	4·0
South Shields.	124,500	25·3	13·8	1·8	1·0	2·3	38	94	3·2
Walsall	100,400	23·3	11·7	1·1	1·0	2·0	45	94	1·7
Northampton.	93,230	17·8	11·6	1·1	1·5	2·2	31	57	4·2
Grimsby ..	85,620	22·9	10·5	1·2	1·4	1·9	34	79	4·1
W. Bromwich	77,600	24·2	12·5	0·8	0·9	3·3	36	88	2·7

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Special Articles.

THE ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER OF THE MINISTRY OF HEALTH.[1]

THE annual report of the Chief Medical Officer to the Ministry of Health shows the Department to have been fully and usefully occupied. The returns published by the Registrar-General relating to births, deaths, and infectious disease, as well as the various data in respect of invalidity under the National Insurance Acts, have been relied upon for the statistical information, while this is supplemented by the investigations undertaken by the medical officers of the Department and of other bureaus interested in the physical, industrial, and social welfare of the people, as well as by reports of medical officers of health, both annual and special.

Sir George Newman has arranged the vast mass of information thus indicated in 12 chapters, the first three of which give an account of the present state of public health in England, of the general epidemiology of the country, and of the relations of public health to infectious diseases of exotic origin. Special sections then deal with tuberculosis, venereal diseases, and maternity and child welfare, the section which has tuberculosis as its subject being a very full statement of the existing machinery both for prevention and cure. Informing summaries of the work of the insurance medical service and of the Poor-law medical service follow, while a valuable section treats of the relation of food to health and disease. An account of local and port sanitation and of international health work bring us to the general conclusion which follows :—

THE RECORD OF 1923.

If we endeavour, writes Sir George Newman, to take a bird's-eye view of the material facts of the physical life and health of the English people during 1923, we shall base our deductions upon four main groups of data :—

(i) The number of births registered in 1923 was 758,131, which showed a decline of 22,000 on 1922 (as compared with a fall of 70,000 in the previous year), and which yielded a birth-rate of 19·7 per 1000.

(ii) The number of deaths in 1923 was 444,786, less by 42,000 than in the previous year. The total death-rate (11·6 per 1000 persons) was the lowest ever recorded in this country; but 40 per cent. of these deaths occurred under 50 years of age.

(iii) The infant mortality-rate—the death-rate of infants under 1 year of age per 1000 born—was also the lowest registered—namely, 69. This means the country saved not less than 45,000 babies' lives over and above the average saving obtained in 1901–10. This is perhaps the greatest recent triumph of preventive medicine.

(iv) The number of cases of epidemic and infectious disease notified in 1923 was 314,183, as compared with 422,919 in the previous year.

These facts and figures give us a record year, but we must be circumspect in drawing unduly favourable conclusions. In the first place, it is obvious that the general death-rate in this country cannot be diminished indefinitely. A time must come when no further improvement in the death-rate is possible, since all who live must die, and even if nobody died under four score and ten years, there would still be a death-rate. It is the number of unreasonably premature deaths which we must seek to reduce. We cannot possibly say when the most favourable death-rate has been reached, nor even what that death-rate should be, but very simple arithmetical considerations will show us that there is a limit; and whilst it is not suggested that there is a "law" of decrement of mortality, it is certainly true that some process of diminishing returns does operate, and that it is incorrect and fallacious to measure the public health conditions of a country wholly by changes in the general death-rate. In the second place we must bear in mind that the particular low mortality in 1923 is in part an expression of the present phase of distribution of our population in regard to age, and to propitious meteorological conditions conducive to the health of infants and elderly persons. Then again, we must to some extent attribute to good fortune the fact that we were spared widespread epidemics. Nevertheless, after all the necessary qualifications have been made, the health of this country in 1923 was very encouraging, and certainly the public expenditure on its maintenance is at present yielding a very high rate of interest in life and well-being.

On the other hand, there is much sickness and physical impairment, which is directly resulting in absence from work, broken time and restricted productivity. Probably such loss of time due to sickness, most of which is preventable, costs the country not less than ten times more than that which it loses owing to strikes and labour disputes. It must not be forgotten that we are in friendly competition with communities which are giving more public attention to social and health problems than we are ourselves. *National ill-health loses time and reduces production* as well as resulting in suffering, discontent, and premature death, and this aspect of the question must be borne in mind. Unfortunately, also, we are still the victims, in some cases the willing victims, of small-pox and venereal disease. Influenza and encephalitis lethargica, bronchitis and pneumonia, tuberculosis and cancer still demand a heavy toll. Many valuable lives are thus being sacrificed, and far too many of our deaths occur under 50 years of age. It is the business of the Public Health Service to concern itself in all that saves life, that postpones the event of death, that reduces sickness and invalidity, and that increases human energy, enlarges its capacity and develops productivity. Thus it should contribute to the efficiency and happiness of life. It is this wider view of their responsibilities that I commend to the local authorities charged with the duty of the sound administration and practice of preventive medicine. It is theirs by wise expenditure and economical organisation to aid and facilitate the rearing and maintenance of a healthy race of people and to continue to attack infection and all forms of insanitation, sickness, and invalidity. The public health is the primary asset of the nation's welfare, whether measured by employability and production, or by length of days, or by personal well-being.

The exceptional features of the year's work are referred to under the respective headings. Generally speaking, it may be said that the experience of the year confirms the broad health policy with which the Ministry of Health was initiated and which in large part it inherited from its predecessors. That policy was fully stated in my first annual report in 1920 and in a special report published the year before. We have steadily pursued these aims. If we are wise we shall continue to follow them, regardless of all temptations to neglect, to idleness, to misdirection, and to the chase of will o' the wisps or "wandering fires." The health organisation of a nation is statecraft. It cannot be established by chance or caprice. It must be broad based on sound foundations. The immediate future seems to require of us that we should have particular regard to the following :—

(*a*) the need for the education of the people in hygiene;

(*b*) wide and comprehensive concentration on the strongholds of disease;

(*c*) the careful coördination and direction of means to ends; and

(*d*) systematic research and investigation.

Public Education in Hygiene.

For a number of years past, in reports to the Board of Education and elsewhere, I have sought to draw attention to the need for public education in hygiene. Last year in my report to your predecessor the following words occur :—

"Preventive medicine is an aspect of social evolution, which involves wide and deep apprehension and practice in society as a whole. It concerns individual habit and communal custom. It must not only follow in the wake of growing knowledge and await that knowledge, but it is dependent on the readiness of the great mass of the people to accept, understand and apply that knowledge, at least in substance and principle. All wise government no doubt depends on the assent of the governed, but in public and private medicine an even fuller assent is needful, if the individual is to reap his full advantage and at the same time act loyally as a member of the community. In fact, he is under obligation to cultivate his own health and capacity, and so to conduct himself as not to conduce to the hurt or risk of his neighbours. Hence the progress of preventive medicine depends in extraordinary degree upon the enlightenment and education of the people. There is no doubt that owing to the national system of education, to voluntary educational movements and societies, and to the valuable agency of the press and public opinion, such enlightenment is proceeding apace. Yet it has far to go."

In view of the importance of the subject, you have called for a special memorandum which will be published at an early date, and it is therefore unnecessary further to deal with the question here. It is significant that the official reports of medical officers of health for 1923 show increased

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[1] H.M. Stationery Office and all Booksellers. 1924. Pp. 211. 5s. net.

MENTAL HOSPITALS SERVICE.

THE annual report for 1923 of the *Royal Eastern Counties Institution for the Mentally Defective, Colchester,* reveals a satisfactory financial position, despite the expense involved in recent extensions. When it is remembered that this institution possessed only 400 beds in 1914, and now has 1070, and that a proportion of the annual cost of upkeep has to be met by voluntary contributions, the progress made during this period of ten years appears truly remarkable. Perhaps nowhere else are there more complete facilities for the education of all grades of defectives; the inmates are divided into no less than 25 classes, and every effort is made to render the members of each as useful to society as careful training can make them. Unfortunately, recent admissions have included an increasingly high proportion of low-grade patients. Boards of guardians are sending the better grade and well-behaved cases to smaller homes and workhouses, where their capabilities for work without previous elaborate training are naturally appreciated. The Mental Deficiency Act is intended to apply equally to this class of case, a fact not apparently appreciated by local authorities. It was not intended, and it is not just, that such institutions as this should be filled largely with low-grade cases requiring much nursing care, while cases capable of deriving greater benefit from training are kept elsewhere. One effect of this development, which interferes seriously with the valuable work of this institution, is that "the low-grade classes get full, and though there may be plenty of beds in other classes, cases have to be refused." As the medical superintendent, Dr. F. D. Turner, remarks, the Mental Deficiency Act has never yet been fully applied; there is nothing like enough accommodation, and at the present time numerous adult defectives are in asylums. Sooner or later the accommodation on one side or the other will be extended, and it will then have to be decided whether such patients are to be sent where they really belong, and existing asylum beds employed for cases of acquired and recoverable insanity. The functions of these two classes of institution are totally distinct; one exists for training and the other for therapy, and when the question is viewed from this standpoint there can be no two views as to the proper place for the adult defective. Further accommodation under the Act is much required, and the transfer of such patients as these from the asylums will leave the latter with a number of beds which in many cases are badly needed for the insane. Progress is being made at this institution with the "hostel" and "parole" treatment, although the difficulty of obtaining outside employment for these cases is still considerable. Bridge Home, the new building, owes much of its domestic equipment and stores to the industry of inmates in the existing workshops. A kinema is being installed, and a film showing the work of the institution is being exhibited in England and even abroad. Both in detail and in its observations on general questions in mental deficiency this report is of outstanding interest.

The report of *The Retreat, York,* for 1923 is a very readable survey of the events of the year in that mental hospital, including observations on two or three subjects of general interest. Several structural changes are being made, the most important of which is the building of a new nurses' home. Throxenby Hall, Scarborough, used in the past as a holiday and convalescent home, has been given up, and this year a country house elsewhere was rented in its place. Millfield, another country house not far from the Retreat itself, which was acquired four years ago as a home for incipient and "borderland" cases, is henceforth only to be used for quiet chronic insane. It was with great regret that the original purpose for which this building was intended had to be given up. Two reasons decided this step—the heavy financial loss entailed, and the impossibility for the Retreat medical staff of devoting sufficient time to the psychotherapeutic treatment necessary for such patients. Dr. Henry Yellowlees, the medical superintendent, points out that with six real "borderland" cases, each requiring a minimum of four private interviews per week, "24 hours of somewhat exhausting and highly specialised work" would be entailed. All the cases treated there during the past have not required such intensive treatment, and a large number have benefited. That this step has by no means closed the avenue to institutional care for such patients may be gathered from the fact that no less than 48 per cent. of admissions to the Retreat itself were voluntary boarders. The policy of encouraging voluntary admissions has on the whole worked well, only very few of these patients requiring eventual certification. One voluntary boarder who appeared to have recovered fully, and was indeed making arrangements for departure, committed suicide by hanging. As Dr. Yellowlees observes, this case illustrates a problem of the greatest difficulty: "The acutely suicidal patient is, in comparison, an easy proposition. . . . A time comes when a patient is convalescent, and precautions *must* be relaxed. He will not recover if he is not trusted, and obviously we cannot prove that he is not suicidal as long as he has no possible opportunity of making an attempt." The malarial treatment for general paralysis, and the search for and treatment of focal infections, have been applied in a small number of suitable cases. It is also recorded that one of the padded rooms has been converted into a linen cupboard, a fact of small importance in itself, but deriving a certain interest from the context. "Only one padded room now exists at the Retreat. It has been largely used during the year by a gentleman who regards permission to sleep therein a great privilege, awarded for good behaviour."

The annual report for 1923 of the *Down District Lunatic Asylum, Downpatrick,* contains the same excellent series of 13 photographs of the buildings as appeared in last year's issue; the impression created is one of prosperity and efficiency, which stands in sharp contrast with the condition of many asylums in other parts of Ireland. There is accommodation for 800 patients, and the number now resident is only 716. Particular attention is being devoted to the training of nurses. The "representatives of the staffs" are said to have demanded the withdrawal from the service of those who fail to pass such a test (as an examination) after reasonable opportunity. Thirty-one nurses and attendants have passed in various parts of the examination for the certificate of the Medico-Psychological Association. The recovery-rate for this hospital during the year under review was over 50 per cent.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 9TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely—Small-pox, 37; scarlet fever, 1260; diphtheria, 576; enteric fever, 99; pneumonia, 378; puerperal fever, 42; cerebro-spinal fever, 3; acute poliomyelitis, 30; acute polio-encephalitis, 2; encephalitis lethargica, 48; trench fever, 1; dysentery, 4; ophthalmia neonatorum, 118.

Deaths.—In the aggregate of great towns (including London) there were 2 deaths from enteric fever, none from small-pox, 7 from scarlet fever, 24 from diphtheria, 18 from measles, and 18 from influenza. In London itself the diphtheria deaths numbered 6.

INDEX TO "THE LANCET," VOL. I., 1924.

THE Index and Title-page to Vol. I., 1924, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Special Articles.

THE ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER OF THE MINISTRY OF HEALTH.[1]

THE annual report of the Chief Medical Officer to the Ministry of Health shows the Department to have been fully and usefully occupied. The returns published by the Registrar-General relating to births, deaths, and infectious disease, as well as the various data in respect of invalidity under the National Insurance Acts, have been relied upon for the statistical information, while this is supplemented by the investigations undertaken by the medical officers of the Department and of other bureaus interested in the physical, industrial, and social welfare of the people, as well as by reports of medical officers of health, both annual and special.

Sir George Newman has arranged the vast mass of information thus indicated in 12 chapters, the first three of which give an account of the present state of public health in England, of the general epidemiology of the country, and of the relations of public health to infectious diseases of exotic origin. Special sections then deal with tuberculosis, venereal diseases, and maternity and child welfare, the section which has tuberculosis as its subject being a very full statement of the existing machinery both for prevention and cure. Informing summaries of the work of the insurance medical service and of the Poor-law medical service follow, while a valuable section treats of the relation of food to health and disease. An account of local and port sanitation and of international health work bring us to the general conclusion which follows:—

THE RECORD OF 1923.

If we endeavour, writes Sir George Newman, to take a bird's-eye view of the material facts of the physical life and health of the English people during 1923, we shall base our deductions upon four main groups of data:—

(i) The number of births registered in 1923 was 758,131, which showed a decline of 22,000 on 1922 (as compared with a fall of 70,000 in the previous year), and which yielded a birth-rate of 19·7 per 1000.

(ii) The number of deaths in 1923 was 444,786, less by 42,000 than in the previous year. The total death-rate (11·6 per 1000 persons) was the lowest ever recorded in this country; but 40 per cent. of these deaths occurred under 50 years of age.

(iii) The infant mortality-rate—the death-rate of infants under 1 year of age per 1000 born—was also the lowest registered—namely, 69. This means the country saved not less than 45,000 babies' lives over and above the average saving obtained in 1901–10. This is perhaps the greatest recent triumph of preventive medicine.

(iv) The number of cases of epidemic and infectious disease notified in 1923 was 311,183, as compared with 422,949 in the previous year.

These facts and figures give us a record year, but we must be circumspect in drawing unduly favourable conclusions. In the first place, it is obvious that the general death-rate in this country cannot be diminished indefinitely. A time must come when no further improvement in the death-rate is possible, since all who live must die, and even if nobody died under four score and ten years, there would still be a death-rate. It is the number of unreasonably premature deaths which we must seek to reduce. We cannot possibly say when the most favourable death-rate has been reached, nor even what that death-rate should be, but very simple arithmetical considerations will show us that there is a limit; and whilst it is not suggested that there is a "law" of decrement of mortality, it is certainly true that some process of diminishing returns does operate, and that it is incorrect and fallacious to measure the public health conditions of a country wholly by changes in the general death-rate. In the second place we must bear in mind that the particular low mortality in 1923 is in part an expression of the present phase of distribution of our population in regard to age, and to propitious meteorological conditions conducive to the health of infants and elderly persons. Then again, we must to some extent attribute to good fortune the fact that we were spared widespread epidemics. Nevertheless, after all the necessary qualifications have been made, the health of this country in 1923 was very encouraging, and certainly the public expenditure on its maintenance is at present yielding a very high rate of interest in life and well-being.

On the other hand, there is much sickness and physical impairment, which is directly resulting in absence from work, broken time and restricted productivity. Probably such loss of time due to sickness, most of which is preventable, costs the country not less than ten times more than that which it loses owing to strikes and labour disputes. It must not be forgotten that we are in friendly competition with communities which are giving more public attention to social and health problems than we are ourselves. *National ill-health loses time and reduces production* as well as resulting in suffering, discontent, and premature death, and this aspect of the question must be borne in mind. Unfortunately, also, we are still the victims, in some cases the willing victims, of small-pox and venereal disease. Influenza and encephalitis lethargica, bronchitis and pneumonia, tuberculosis and cancer still demand a heavy toll. Many valuable lives are thus being sacrificed, and far too many of our deaths occur under 50 years of age. It is the business of the Public Health Service to concern itself in all that saves life, that postpones the event of death, that reduces sickness and invalidity, and that increases human energy, enlarges its capacity and develops productivity. Thus it should contribute to the efficiency and happiness of life. It is this wider view of their responsibilities that I commend to the local authorities charged with the duty of the sound administration and practice of preventive medicine. It is theirs by wise expenditure and economical organisation to aid and facilitate the rearing and maintenance of a healthy race of people and to continue to attack infection and all forms of insanitation, sickness, and invalidity. The public health is the primary asset of the nation's welfare, whether measured by employability and production, or by length of days, or by personal well-being.

The exceptional features of the year's work are referred to under the respective headings. Generally speaking, it may be said that the experience of the year confirms the broad health policy with which the Ministry of Health was initiated and which in large part it inherited from its predecessors. That policy was fully stated in my first annual report in 1920 and in a special report published the year before. We have steadily pursued these aims. If we are wise we shall continue to follow them, regardless of all temptations to neglect, to idleness, to misdirection, and to the chase of will o' the wisps or "wandering fires." The health organisation of a nation is statecraft. It cannot be established by chance or caprice. It must be broad based on sound foundations. The immediate future seems to require of us that we should have particular regard to the following:—

(*a*) the need for the education of the people in hygiene;
(*b*) wide and comprehensive concentration on the strongholds of disease;
(*c*) the careful coördination and direction of means to ends; and
(*d*) systematic research and investigation.

Public Education in Hygiene.

For a number of years past, in reports to the Board of Education and elsewhere, I have sought to draw attention to the need for public education in hygiene. Last year in my report to your predecessor the following words occur:—

"Preventive medicine is an aspect of social evolution, which involves wide and deep apprehension and practice in society as a whole. It concerns individual habit and communal custom. It must not only follow in the wake of growing knowledge and await that knowledge, but it is dependent on the readiness of the great mass of the people to accept, understand and apply that knowledge, at least in substance and principle. All wise government no doubt depends on the assent of the governed, but in public and private medicine an even fuller assent is needful, if the individual is to reap his full advantage and at the same time act loyally as a member of the community. In fact, he is under obligation to cultivate his own health and capacity, and so to conduct himself as not to conduce to the hurt or risk of his neighbours. Hence the progress of preventive medicine depends in extraordinary degree upon the enlightenment and education of the people. There is no doubt that owing to the national system of education, to voluntary educational movements and societies, and to the valuable agency of the press and public opinion, such enlightenment is proceeding apace. Yet it has far to go."

In view of the importance of the subject, you have called for a special memorandum which will be published at an early date, and it is therefore unnecessary further to deal with the question here. It is significant that the official reports of medical officers of health for 1923 show increased interest in this matter. Much admirable popular instruction is now undertaken in maternity, tuberculosis, and venereal disease. But it needs development, expansion, and even wider dissemination. It must begin in the elementary schools, but it should continue all through life. It should be particularly concerned with personal hygiene, nutrition, and the right use of milk and other foods. It should be definitely related to the whole sanitary service, and to the improvement of national physique and capacity. "To make the unfit fit," said the late Dr. Herman Biggs of New York, whose recent death we all deplore, "is a worthy task, but to make the fit fitter is a larger and higher achievement."

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[1] H.M. Stationery Office and all Booksellers. 1924. Pp. 211. 5s. net.

Need for Comprehensive Practice.

The modern development of the Public Health Service has been characterised by an expansion and amplification of the former practice of sanitation and has found expression in more direct methods of attack on particular diseases. This has been due partly to the stabilised condition of the older sanitary measures and partly to the growth of knowledge of the causes of disease and the means of their prevention. So long as due and continuous attention be given to fundamental sanitation and the ordinary practice of hygiene these wider applications of preventive medicine are likely to prove wholly advantageous. But if they be used in substitution for a sanitary environment and healthy living, or even if they be used apart from a sanitary environment in its fullest sense, then we must not expect them to yield their full value. Take tuberculosis—the direct attack on this disease, the treatment of the affected person, the dispensary, the sanatorium, the hospital, adequate after-care—this is all as it should be, but it is not enough. The nutrition of the whole people, life in the sunlight and open air, proper housing, clean workshops, a wholesome milk-supply, healthy habits—these also are necessary, even more necessary, for they are the means of prevention, they reduce infection and they fortify the resistance of the individual. Take venereal disease—the special clinics where early and effective treatment is provided are of immediate importance, for they heal the patient and make him non-infective; but *avoidance of infection*, chastity, high moral standards and all that subserve their practice provide the true prevention. Take maternal mortality—as I have already pointed out, the only sound course is to prepare against it rather than attempt at the eleventh hour to save a desperate situation. The education of the medical student in obstetrics, improved midwifery, the abolition, or proper equipment, of the "handy woman," the stamping out of unjustifiable "covering" by the medical attendant, the provision of maternity homes or otherwise securing their facilities, the universal adoption by all expectant mothers of antenatal hygiene—these are the ways, and the only ways, of reducing maternal mortality in the long run. Even cancer is a disease to which we must apply broad principles. *Surgical aid at an early stage of the disease* is now the proper course—but I do not doubt that the time will come when all men will understand that a healthy way of life, the true physiology of the normal functioning of the body, combined with some degree of natural or acquired immunity, will be our best protection against this scourge. By all means let us seek to apply the direct means of amelioration in all diseases as they are made clear to us by investigation and experience; but all the time our building must be on sure and solid foundations—(1) the nutrition of the body of man, (2) the sanitary environment in which it survives, and (3) the biological laws of Nature.

The Direction of Means to Ends.

Another point which emerges continually in the text of this Report is the adaptation and coördination of means to ends. In 1919 the Ministry published a memorandum which set out in detail a health programme for every local authority and suggestions as to the way in which such a national standard could be fulfilled.[2] This document has had a wide circulation, but there are still many authorities, and I must add many medical officers of health, who have apparently paid no regard to it. They still "muddle on" from hand to mouth, the victims of every passing whim or popular "stunt," instead of organising their work as responsible and competent men charged with the duty of directing the public service of their district on behalf of all who have the fortune, or misfortune, to live within its boundaries. Yet public health workers should be inspired by science and by statecraft, for upon their labours depend the lives and fate of vast populations. The opportunity is theirs, and the instrument is in their hands. There is all the machinery of the sanitary service, there is the maternity and infant welfare service, the school medical service, the health insurance system, the Poor-law medical service, the sanitary cordon—they are all there, provided by statute, expressive of the will of the people; but in many districts they are not being sufficiently used or sensibly applied; workable machinery, but unused and inadequately working. It is not money they lack, but will-power and such careful, economical and foreseeing coördination and direction as the particular needs of each area indicate, the backward authorities striving to emulate the more advanced and enlightened. The progress of the science and art of medicine in the last quarter of a century has, it is true, outstripped the organisation of our sanitary, Poor-law, and education authorities. The new wine is being poured into old wine-skins. But what is much more pertinent to our labours, *we fail in hundreds of sanitary districts to use the facilities provided*. On the whole the existing facilities are reasonably well furnished; but all too often people fail to use them, and the authorities fail to coördinate them.

Research and Investigation.

The fourth great need of the immediate future is research. Everything could be done better than it is being done—if we only knew how to do it. We are still in the dark as to the cause of measles, of influenza, of encephalitis lethargica, of rheumatism, and of cancer. Happily, in 1923 there was a great awakening in the public mind in regard to the importance of research in cancer. It would be difficult to exaggerate that importance. All good citizens should learn to recognise it, for the truth here, when found, will inevitably lead to the conquest of new kingdoms of understanding of man's life. Definite and constructive progress is being made, and this should be our encouragement. Every insurance doctor and every medical officer all through the public services should be a man of research, of inquiry, of open and seeking mind, bent on investigation into the causes of things; and I must add that every insurance committee or local authority served by such men should be alive to the duty and opportunity of research, the true scientific method—providing for it, encouraging it, and applying its spirit in their own administration as well as to the growth of knowledge.

THE MAYO CLINIC, ROCHESTER, MINN., U.S.A.

(FROM A SPECIAL CORRESPONDENT.)

The Ketogenic Diet in Epilepsy.

AT a meeting of the Northwest Pediatric Association held here on August 2nd Dr. M. G. Peterman, of the Clinic, read a short paper on the Ketogenic Diet in the Treatment of Epilepsy. The instigation of this treatment was inspired by a consideration of the factors operating in starvation of epileptics, which would appear to be successful in some cases. One important effect of starvation is the production of ketosis, and it was felt that a less drastic method of producing ketonæmia might be equally effective in controlling the seizures. Certain theoretical considerations support this somewhat empirical procedure. Of the three ketone bodies diacetic acid alone has a toxic effect, and this effect is similar to that of the anæsthetics. In common with these, diacetic acid is soluble in fats and lipoids, and presumably shares their property of penetrating the lipoids of the central nervous system. The beneficial effect of chloroform or ether anæsthesia in suppressing epileptic attacks for a considerable length of time has been frequently noted, and it seems not impossible that diacetic acid might similarly be of value. Feeding or injecting diacetic acid is not practicable, as the body easily converts it into non-toxic substances. The ketonæmia is produced by a restriction of carbohydrate metabolism. Since protein may be largely converted into glucose, this is restricted to the minimal requirement of 1 g. per kilogramme of body-weight in children and about 0·75 g. in adults. About 10 to 15 g. of carbohydrates are given, and the balance of the total calories, which should not exceed the actual metabolic requirements, is made up from fats. Vitamin and salt requirements must not be considered in planning the diet. The diets should be instituted gradually, as they may not be tolerated at first. Of the 20 cases reported under this regimen, 17 have been entirely free from convulsions for periods varying from 1 to 15 months. Two of the cases were considerably improved, but still had occasional convulsions. One of them is a case of hysteria who has been subjected to severe mental traumata, and in the other case it is not known if the ketosis still exists. The parent of this last patient is under treatment for syphilis. The one entirely unsuccessful case is a post-encephalitic undergoing mental degeneration. The children do not seem to suffer in any way from the effects of ketosis. Two of them had gastro-intestinal upsets, and were put on general diets with restricted carbohydrate for a short time. Both remained free from attacks and on recovery returned to the ketogenic diet.

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[2] Outline of the Practice of Preventive Medicine. Cmd. 363. 6*d*.

Pyelitis in Children.

Dr. H. F. Helmholz, President of the Association, and head of the Department of Pediatrics at the Mayo Clinic, has reported a series of eight cases of pyelitis in children resulting from a condition described as "cord bladder." The term "cord bladder" is intended to describe an atonic condition of the organ resulting from a congenital defect in its innervation. Spina bifida or spina bifida occulta is present in about half the cases, and dribbling, which is frequently present, is a very suggestive symptom. As much as 180 c.cm. of residual urine were removed from the bladder in one instance. The result of this atony, which characterises the entire urinary tract in these cases, is a damming back and stagnation of urine in consequence of which pyelitis easily develops. Cystograms were shown in which injected fluid had passed with ease up the dilated ureters into the pelvis of the kidney. Dr. Helmholz has so far been unable to devise any effective method of treatment.

Bust of Harvey Presented to the Mayo Foundation.

At the weekly meeting of the general staff on July 30th, Dr. L. G. Rowntree, of the Mayo Clinic, presented to the Foundation a bronze bust of Harvey, which he had greatly admired at the Physiological Congress held in Edinburgh last year. The bust was one of two executed for the Congress by Pilkington Jackson. After returning to this country Dr. Rowntree wrote to Mr. Jackson and succeeded in obtaining the identical bust which had stood behind the president of the Congress at its opening meeting. After an impressive and laudatory appreciation of Harvey's genius, Dr. Rowntree closed by saying: "It is my fondest wish, in fact my prayer, that with this bust of Harvey his spirit may descend upon us and permeate the entire work of the Foundation and of this institution as a whole, and may abide here always." Dr. Wilson, in a speech of acceptance on behalf of the Mayo Foundation, referred to the similarity, both physical and mental, between Harvey and Shakespeare, and thanked Dr. Rowntree for a gift which he characterised as particularly appropriate to a Foundation established for the encouragement of medical education and research.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Regius Professor of Surgery, Glasgow University.

Mr. Archibald Young, who has been appointed by the Crown authorities to the Regius Chair of Surgery in Glasgow University in succession to the late Sir William Macewen, assumes his duties with a wide experience of teaching, both clinical and systematic. For five years he was lecturer in surgery in the Western Medical School, until 1913, when he was elected professor of surgery in the Anderson College of Medicine, of which, for the past year, he has acted as Dean. Prof. Young is 50 years of age. In 1893 he took the B.Sc. degree with anatomy and physiology as principal subjects, and in 1895 he graduated M.B., C.M. with high commendation. In 1913 he became F.R.F.P.S. Glasg. after examination. After a period as private assistant to Prof. Joseph Coats in the department of pathology, Mr. Young became associated with Sir William Macewen as his senior assistant on the staff of the University. Thereafter he held the usual junior positions on the surgical staff of the Western Infirmary, and in 1917 he was appointed visiting surgeon to that institution. For the previous nine years he had acted as consulting and visiting surgeon to the Broadstone Jubilee Hospital, Port Glasgow.

Prof. Young has made many exact and well-balanced contributions to surgical literature. As a civil surgeon in the South African War he gave minute attention to the features of injuries of peripheral nerves, and his report on this subject was included as an appendix to the official Surgical Report of the War. During the European war his position as neurological expert to the Glasgow district gave him access to a mass of similar material, and his painstaking observations were presented at the last meeting of the Société Internationale de Chirurgie. He is well known as an exponent of the operative treatment of fractures, and his work on this subject has been widely quoted. Earlier in his career he elaborated a modification of the Wolfe-Krause method of whole skin grafting, and incorporated the results obtained by his method in a paper still recognised as authoritative. Prof. Young may be relied upon to stimulate surgical research in his department, and at the same time to maintain the high level of surgical training which characterised the Glasgow School of Surgery under his old chief, Sir William Macewen.

The New South-Eastern Counties Sanatorium.

Dr. Charles Cameron has just issued his first report on the East Fortune Sanatorium, covering the period from the opening on Dec. 1st, 1922, up to May 15th last. He is modest about the scope of such a report and refuses to draw inferences from the admissions in regard to the incidence of various types of disease; for, as he truly says, the admissions represent efforts at treatment, they give no indications of the numbers of varying ages who remain at home. The methods of treatment adopted have been strictly orthodox, and Dr. Cameron makes no secret of the fact that he has enforced strict hospital discipline at the sanatorium, with the result that a number of patients have refused to coöperate with him—15 adults left or were removed by their relatives. Fortunately, however, a large proportion of his patients are children with whom no such difficulty arises. Adventitious aids to treatment were unimportant. It was wisely decided to continue during the winter months by means of carbon-arc light the treatment by sunshine, the supply of which had already been scarce enough in the summer, and tuberculin in two forms was being used, but Dr. Cameron regards the part played by drugs as quite subsidiary, although cod-liver oil may prove beneficial, especially in cold and sunless weather. Of the 103 patients so far discharged, one child with abdominal tuberculosis died, three adults with pulmonary tuberculosis were worse, while the condition of the remainder was stationary or better, arrest of the disease being recorded in two adults (lungs) and 15 children (lungs 3, glands 8, spine 1, abdomen 2, bladder 1). The duration of residence being primarily determined by willingness to stay, Dr. Cameron's aim is to retain patients until the disease shows evidence of being healed.

The Henry Brock Vale of Leven Cottage Hospital.

A well-equipped cottage hospital has been established at Broomley House, Balloch, for the inhabitants of the Vale of Leven through the munificence of the late Mr. Henry Brock, of Darleith, who left a bequest of £15,000 for the purpose, and recently the hospital was formally opened by the sister of the donor. Broomley House, with its surrounding grounds, was purchased by the trustees last year, and the necessary additions and alterations to convert it into a hospital were made with the advice and assistance of Colonel D. J. Mackintosh, of the Western Infirmary, Glasgow. At the opening ceremony Colonel Mackintosh said that the original building with the necessary additions provided a complete cottage hospital. So far as the cost was concerned, it compared very favourably with any similar institution and was equal to the best of its kind for working. The wards were of ample cubic capacity and adjoined the fully-equipped operating theatre, so that service was reduced to a minimum. The children's ward, with its balcony in front, was furnished with four cots and there was a large room which could be used for private patients.

Births and Deaths.

The monthly return of the Registrar-General for 16 of the principal burghs records a birth-rate of 22·8 per 1000, less by 1·4 than the corresponding month of last year; the rate was highest in Hamilton, Motherwell, Glasgow, and Greenock; lowest in Kirkcaldy, Clydebank, and Dunfermline. Of the 4636 children registered during the month, 301, or 6·5 per cent., were illegitimate, the proportion, as usual, being high in Edinburgh. The death-rate for the burghs was 11·7 per 1000, being 0·4 higher than the corresponding month of last year, and varying from 14·7 in Paisley down to 7·7 in Dunfermline. The deaths of children less than 1 year old numbered 313, equivalent to an infant mortality-rate of 65 per 1000 births; the local rate was 119 in Paisley, 79 in Greenock, 76 in Aberdeen, and 74 in Glasgow, down to 14 in Dunfermline and 29 in Ayr. Deaths from epidemic disease numbered 156, including 1 from enteric fever, 25 from measles, 15 from scarlet fever, 52 from whooping-cough, 21 from diphtheria, and 42 from the diarrhœas of childhood. The influenza deaths numbered only 17, having fallen from 43 in May and 28 in June. Deaths from encephalitis lethargica numbered ten, as compared with 22 in June and 24 in May.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Free State and the Medical Register.

THE Medical Bill, promoted by the Government of the Irish Free State in the Oireachtas, of which mention was recently made in THE LANCET (August 2nd, p. 235), has been somewhat unexpectedly postponed to next session. The Minister in charge of the Bill, speaking in the Senate, said that the information that he had received was that the General Medical Council desired to have a little more time, and they proposed not to introduce legislation in Britain until October. They had previously, at a conference, decided to introduce legislation corresponding to the Bill before the Senate, and have it passed before the summer recess. They now intimated that they could not get the measure introduced, and they would hold it over until October, and would not interpret those Acts as they had previously done. Medical students would continue to come under the operation of the General Medical Council and would be registered until this matter was again taken up.

Sir Patrick Dun's Hospital.

The friends of Sir Patrick Dun's Hospital have been engaged in an intensive campaign to raise funds for the rebuilding of the hospital. The present edifice is more than a hundred years old, and is incapable of being rendered adequate for present requirements, so that the governors are forced to consider the question of rebuilding. They are, however, sympathetic with the suggestion of amalgamating their hospital with several of the other smaller hospitals of Dublin, and they pledge themselves not to proceed with building until they have had a full consultation with the authorities of other hospitals to discuss the easibility of carrying through a scheme of amalgama-ion. There is no doubt that more efficient service ould be rendered to the public if five of the smaller ospitals on the south side of Dublin were to unite. It is known that the staffs of these hospitals are rongly in favour of amalgamation, but a considerable apital outlay will be necessary.

A Short Strike.

A strike of the municipal workers in Dublin and the suburbs took place recently, which, if it had been prolonged, might have had serious effects on the public health. The municipal authorities had discussed the propriety of making a cut in wages in September, and although no decision had been made the workers withdrew their labour. For several days refuse was not cleared away, and for a night or two public lighting was stopped. Fortunately, there was no interference with the water-supply. During the cessation of lighting the strikers made arrangements that the supply of electricity to bakehouses and hospitals should not be interrupted. The strike was settled before there was a general interruption of the industries dependent on electric supply.

Neglect of Vaccination.

For many years past there has been an almost complete neglect of vaccination in many parts of Ireland. This was in part due to the inertia of the late Local Government Board, and in part to a campaign against vaccination. The Ministry of Local Government is now stirring and the attention of the local authorities is being drawn to the necessity of enforcing the vaccination laws. The worst area is in the south-east, Wexford and neighbouring counties, a district in which the propaganda against vaccination has been most vigorously pressed. Of one sanitary district the medical officer reports: "No vaccinations done during the half year; parents had altogether discontinued bringing their children to be vaccinated." Of another it is reported: "The people don't believe in vaccination." In Camolin district, in Co. Wexford, there has been practically no vaccination since 1910. In a neighbouring district vaccination has not been availed of for some years past. The medical officer of Wexford reported that three years ago there were 1406 defaulters, and no vaccinations had been done since. In Bridgetown the only persons who get vaccinated were intending emigrants. In the Navan district of Meath out of 287 children born in the last three years only nine had been vaccinated. In none of the cases has the local authority taken any steps to enforce the law. It looks as if the Ministry will have some trouble to render the population protected against small-pox.

Dublin Hospital Sunday Fund.

At the annual meeting of the Dublin Hospital Sunday Fund held last week it was stated that a sum of £4200 had been distributed among the participating institutions.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Recent French Vital Statistics.

THE medical authorities in France have been unable to publish all the vital statistics for the years subsequent to 1918, but thanks to the courtesy of Mr. A. Moine, of the Comité National de Défense contre la Tuberculose, I have been able to obtain some instructive figures dealing with the period 1918–23. In a table showing the tuberculosis mortality of 53 departments with a population of 25 millions, it is instructive to note how greatly the tuberculosis mortality varies in different places. Thus, in the Department of the Marne there were only 2·51 deaths from tuberculosis per 10,000 persons, whereas in the Department of the Rhône this rate was as high as 38·6 per 10,000. Mr. Moine has also conducted a study of the incidence of tuberculosis in the various districts of Paris, and he has again found that it is extraordinarily patchy: it is endemic in some quarters and hardly known in others. But Mr. Moine sees good grounds for hoping that, by the systematic eradication of the foci of infection, and by improved housing, much can be done to stamp out the disease, which is obviously not so migrant and infectious as epidemic encephalitis and many other diseases. In 1918 there were 293 deaths from pulmonary tuberculosis per 100,000 persons in Paris. Since then there has been an almost uninterrupted decline, and the corresponding figure for 1923 was only 231. Cancer, on the other hand, has risen from 115 deaths in 1918 to 123 deaths in 1923 per 100,000 in Paris. Deaths from typhoid fever have fallen from 5 per 100,000 in 1918 to 0·7 in 1923. In the same period there has been a decline from 8·7 to 1·6 in the deaths from measles. Scarlet fever also shows a decline in the same period from 1 to 0·3. Whooping-cough has declined from 10·5 to 0·6 deaths per 100,000 living persons, and the decline in the diphtheria death-rate is from 4·5 to 0·5. Turning from the Parisian to the general French death-rates, it is interesting to note that between 1919 and 1923 the general death-rate in France has fallen from 19 to 17 per 1000 inhabitants. The infant mortality-rate per 1000 living births has declined from 119 in 1919 to 96 in 1923. In 1922 this rate was as low as 85 per 1000 living births. It is evident from these statistics that within the short period of five years there has been a great advance in the health of the French nation as measured by the most prevalent diseases and the total death-rate, and valuable alike whether France counts her children as “souls” or “bayonets.”

Hygiene and Confectionery.

Although there exists a law in Paris forbidding the sale on open stalls of such articles of food as are consumed without subsequent cooking, this regulation is in effect a dead letter, and recently the Société de Médecine Publique et de Génie Sanitaire has urged a more vigorous application of the law. It is further insisted that more adequate steps be taken to prevent contamination of food exposed for sale in the interior of shops where the constant stream of shoppers brings with it the dust and dirt from the street. This applies particularly to ham and beef shops and to confectioners' displays. Another important question concerns the wrapping up of sweetmeats by hand before they reach the retail trade. This process is often carried out in their homes by employees, adults and children, without any sanitary supervision. One hesitates to think of the possible conditions obtaining in many overcrowded and dirty homes, and the Société rightly demands that this practice shall cease, by forbidding the wrapping up at the worker's home of any edible substance not intended to be cooked.

Hospital Care of Weakly Infants.

At the Hospice des Enfants Assistés, under the control of Prof. Marfan, the mortality among infants under 1 year old was 30 per cent. during the year 1922. This percentage represents a slightly lower figure than in previous years, and is definitely less than the average mortality in hospital creches, which generally exceeds 10 per cent. Dr. Pierre Vallery-Radot, who gave these statistics in a communication to the Academy of Medicine, rightly considers that this figure is too high. As half the number of deaths are due simply to a general state of weakness, he holds that the mortality could be reduced through the organisation of an efficient hospital service for weakly children. The necessary steps would be taken to secure suitable conditions, such as good accommodation under the best conditions of temperature and ventilation, and proper feeding for the weakly infants. He has also outlined measures to provide for breast-feeding, and further to aid in recruiting wet-nurses.

Tuberculous School Teachers.

Tuberculosis among male and female teachers in free schools as well as in public schools may frequently have dangerous consequences for the pupils, whose health ought to be protected against such a risk. On the motion of Drs. Parisot and Violette, the Society of Public Medicine has issued a demand that school teachers and all the school auxiliary staff should submit to a periodical medical examination. Those who show tuberculous lesions already active or likely to become so are informed that they should undergo special examination as frequently as possible. As soon as there is evidence that any risk is being run by the pupils, the affected member of the staff should be given leave from duty or dismissed. To counteract the pecuniary distress which such regulations will entail, the Society demands that reasonable compensation should be made to ensure adequate medical treatment for the affected person, and to provide for his or her family. With regard to the staffs of private schools, this question requires further investigation.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Indications for Operation in Cholelithiasis.

Dr. Károly Engel recently dealt with this subject in a post-graduate course of medicine at the University of Budapest. He said that he was convinced, and his conviction was supported by other clinicians, that cholelithiasis showed a strong tendency to spontaneous healing, in distinction to appendicitis and nephrolithiasis. Healing, of course, was not complete: the gall-stones remained in the gall-bladder, and considerable changes remained permanently in its wall, and it was even possible that the gall-bladder became in some way short-circuited, but clinically the patient recovered and could do a day's work in comfort. In thousands of cases, he held, nature overcame gall-bladder infection without surgical interference, although the process varied greatly with regard to the time required, and it was only when nature failed and sudden acute complications set in that recourse to surgery was justified. On the other hand, it was not advisable to postpone surgical measures until the patient was in a weak state. That this was the general consensus of opinion on the subject was further exemplified by the conclusions reached with regard to this question at the Italian Surgical Congress held recently, where the indications for operation were tabulated as follows: Operation for the removal of gall-stones must be performed (1) in all cases where peritonitis or sepsis threatened; (2) in all chronic cases where the presence of a stone in the bile-duct was shown either by continued icterus or by symptoms pointing to prolonged infection, such as intermittent fever, rigors, emaciation, &c. On the other hand, operation was not allowed (1) in acute cases if a normal resolution could be expected; (2) in chronic cases where attacks of biliary colic occurred at infrequent intervals only, and where stones were voided frequently; and (3) if therapeutic measures—diet, drugs, and baths—were capable of producing lasting improvement. Surgical interference was further sanctioned when continued and severe attacks of colic tended to undermine seriously the patient's constitution, or where such conditions as hydrops or empyema of the gall-bladder were diagnosed.

The Treatment of High Blood Pressure by Sulphur Injections.

Dr. Rusznyak István, assistant physician at the medical clinic of Prof. Koranyi, has found by experience that the irregular occurrence of high blood pressure can be treated with lasting effect by exhibiting sulphur solutions by the intra-muscular route. The procedure is as follows. The first injection of 1 c.cm. of sulphur solution, containing 0·001 g. sulphur, is made in the gluteal region, followed by a second after two or three days; thereafter, at longer intervals, the subsequent doses are gradually increased to 5 or as much as 10 c.cm. of the solution. The injections are admittedly painful, and are generally accompanied by pyrexia, which is apparently beneficial. It has been observed that other artificially produced conditions of fever do not have a lasting effect in reducing high blood pressure. In the majority of cases four to five injections are sufficient for the course of treatment, even if the blood pressure were not completely reduced to the normal level. If necessary, the course can be repeated after several weeks. It was noted as a striking fact that when the necessary course had been completed, and the concomitant reaction had developed, the blood pressure remained at a considerably lower level with a marked degree of permanence. At the same time, the symptoms of headache, vertigo, and pseudo-uræmic manifestations were mitigated, if not, as in some cases, completely abolished. The effect of the sulphur seems to be to check spasms of the arteries, and to inhibit the development of such angio-spasms.

Deep Antisepsis of Wounds.

Dr. Eugen Polya, professor of surgery at the University of Budapest, recently discussed the method of obtaining antiseptic conditions in the deeper tissues of wounds. The method consists in infiltrating the tissues surrounding the wound with a solution of vuzin, in the strength of 1 in 10,000, or with a solution of rivanol, in the strength of 1 in 4000. Some surgeons commend this method highly, while others show less enthusiasm for it. Prof. Polya gave the method a thorough trial, and came to the conclusion that, for the present, he could not recommend it, as if it were not properly administered it might lead to untoward consequences. He admitted that he favoured cautious medical progress only, and would not be disposed willingly to advocate a novel method which introduced an added and superfluous danger to the patient, especially when the old method of antisepsis on the recognised physical basis of thorough opening of the wound and drainage gave such good results. He attributes much importance to the thorough application of iodine to the wound cavity, and, if the wound has been contaminated by earth, then irrigations with vuzin and rivanol prove efficacious. If the wound cannot be perfectly healed with iodine, he maintains permanent irrigation of the wound by Dakin's solution. He has a marked preference for treating a wound, in the first instance, with hydrogen peroxide before the application of iodine; and when it is possible to expect healing by first intention the iodine is omitted altogether. Here irrigation of the wound with rivanol is of value. In earth-soiled wounds it is important to give a prophylactic injection of antitetanic serum, and if the patient is a diabetic then insulin must be administered.

Correspondence.

"Audi alteram partem."

THE VIRUS OF FOOT-AND-MOUTH DISEASE.

To the Editor of The Lancet.

Sir,—Your Dutch correspondent in The Lancet of June 28th, page 1330, states that a committee of six appointed by the German Department of Agriculture was supplied with subcultures of the *Loeffleria nevermanni*, and that I, as a member of this committee, was able to state on May 19th last that the infection tests with this material gave positive results. The explanation which I actually gave on this date was as follows:—

> "... Herr Dahmen has carried out before the Commission infection experiments with a 6 and with a 26 generation culture. The culture labelled Generation 6 produced in the guinea-pig immediate as well as delayed formation of vesicles, whereas the culture labelled Generation 26 led only after repeated inoculation from guinea-pig to guinea-pig, in the manner described by Dr. Dahmen, to the formation of vesicles. ..."

The successful inoculations were thus carried out, *not* by the Commission with any kind of material, but by Prof. Dahmen himself in his own laboratory. Up to the present the Commission has not been able to produce infection with "cultures" made on Dahmen's method, nor with "cultures" which they received at the end of July from Dr. Dahmen himself. The work of the Commission is not yet complete, and the point is up to the present not fully cleared up whether the so-called cultures actually consist of living micro-organisms.

I am, Sir, yours faithfully,

F. K. Kleine.

Robert Koch Institute for Infectious Diseases,
Berlin, N. 39, August 13th, 1924.

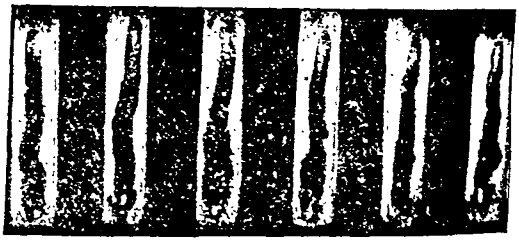
THE CLINICAL THERMOMETER AS A CARRIER OF INFECTION.

To the Editor of The Lancet.

Sir,—The following experiments were undertaken to determine whether the clinical thermometer, having been used in the mouth of one patient and then washed in tap water and dried on a clean towel, is capable of conveying bacteria to the mouth of another patient. It is not for a moment contended that this is the method of cleansing adopted by every medical practitioner, but it is maintained nevertheless that this is a procedure of everyday occurrence. Surely there are few people who have not seen the thermometer taken from the patient's mouth, washed in water, either in the bedroom jug or in a tumbler, dried on a towel, and replaced in its case.

In order to test the efficacy of this method of cleansing, some saliva was placed in a tube and to this a small portion of a culture of *B. prodigiosus* was added, and in this mixture clinical thermometers were placed.

In the first experiment, after being infected in this way, the thermometer was well rinsed in a jug of tap water in which it was briskly moved backwards and forwards 20 times; it was then wiped by drawing it through a clean piece of cloth, firm pressure being exerted between the finger and thumb holding the cloth, the cloth was then folded over and the process of wiping repeated. The thermometers were placed in tubes containing sterile broth in which they were well rinsed. These tubes were incubated for six hours and from each a culture on to a nutrient agar slope was taken; this was incubated overnight and then left at room temperature.



Cultures from clinical thermometers, infected with *B. prodigiosus*, which have been washed in water and wiped with clean cloth.

The result of the above was that in 12 observations, using six different clinical thermometers, a culture of *B. prodigiosus* occurred in each case.

As washing the thermometer in the way above described does not result in removing the infecting bacteria, in the next experiment the thermometers were washed in a stream of tap water, being held in the running water for 30 seconds. In 12 observations, however, *B. prodigiosus* cultures were obtained in each case.

Three more observations were made in running tap water for 60 seconds and a further three for three minutes, the thermometers being wiped as previously described, after being held under the tap. Cultures of *B. prodigiosus* were obtained in each case. In order to avoid the faint possibility of the tap water or the pieces of cloth, on which the thermometers were wiped, being contaminated with *B. prodigiosus*, three cultures of tap water and three cultures from the samples of cloth used were made, but in no instance was the organism recovered.

The remedy for this appears to be obvious; but in order that the method of cleansing may be satisfactorily carried out, the help of the instrument-maker is needed. First, we must have his assurance that the markings on the thermometer will resist prolonged immersion in a reliable antiseptic; and secondly, a suitable case is necessary which will hold the antiseptic fluid and thermometer and ensure that no leakage can occur in the pocket. It is scarcely necessary to state that the addition of a small amount of antiseptic to the water in which the thermometer is rinsed in this manner is not sufficient for the purpose, for, if carbolic acid is used, five minutes is the bare minimum time in which a thermometer which had been infected with *B. typhosus* could be disinfected if the concentration of carbolic acid was only 1 per cent.

The photograph shows the cultures of *B. prodigiosus* obtained after "cleansing" the thermometers in the manner here described.

I am, Sir, yours faithfully,
H. C. Brown, C.I.E., M.B., B.Ch. Camb.,
Major, I.M.S. (retd.).

Wellcome Bureau of Scientific Research,
August 18th, 1924.

PUPIL MONEY: AN UNPUBLISHED LETTER FROM JOHN HUNTER.

To the Editor of The Lancet.

Sir,—These two letters fill a gap in Dr. G. C. Peachey's excellent Memoir of William and John Hunter (see p. 376). They were given to my father, Mr. Henry Power, on Oct. 24th, 1888, by Mr. Charles Hawkins, who says in a covering letter, "There is no doubt that Hunter was not entitled to more than one-fourth share of the fees. This is clear from the letter of Mr. Williams which I enclose: you may keep it, and there are not many letters extant from a pupil of St. George's Hospital at its foundation in 1733. Hunter was not ungenerous. I believe he only meant in claiming the extra fees to use a *rough* threat to induce his colleagues to work harder at the hospital. I think *his* letter I enclose—which you may also keep—goes to show this."—I am, Sir, yours faithfully,

D'Arcy Power.

Chandos-street, W., August 16th, 1924.

1. *From John Hunter, to the Surgeons at St. George's Hospital.*

Gentlemen,—On Monday I sent you a letter the purport of which I need not mention; and on the same day a Gentleman enter'd with me for 6 months; altho' the time of settling was past, and therefor whoever enter'd was to be brought into the next quarter; yet to prevent even a shadow of suspicion that I might have keeped back the Gentleman's entering till the quarter was over, I have sent the three shares. This is a mere point of delicacy, and unnecessary, if every Man acted upon strictly honorable terms. I am, your obed^{t} Serv.,

John Hunter.

Leicester Sq^{r}.
July 11th, 1792.

The letter is addressed to Messrs. Gunning, Walker, and Keate, St. George's Hospital. It is docketted: "Mr. Hunter's Letter to the Surgeons of the Hosp^{l}. 11th July, 1792."

2. *From Mr. Thomas Williams to Mr. John Gunning.*

Sr.—As you desire me to inform you what was the Custom at St. Georges Hospital respecting the division of the Pupil Money arising from the attendance of the surgeons Pupils there in my time; I must declare that I remember well from its first Institution in the years 1733, 1734 & 1735 to the year 1739 and later when I attended as an apprentice to Mr. Wilkie, the money arising from the Pupils in Common, and from the apprentices paying as Pupils in particular was equally divided amongst the surgeons; and that I remember likewise that the Surgeons Pupils were never considered as belonging to any particular Surgeon but as Pupils at large to the Hospital and under the Direction of all the surgeons alike.

I am S^{r}.
Your most Obd^{t} Servant,
Thos. Williams.

Queen Street, Soho Square, Nov^{br} 27, 1792.

Addressed: John Gunning, Esq^{r}. Docketted: "Mr. Williams, Surg^{n} Lock Hospital, to Mr. Gunning, 27th Nov., 1792."

"CANCER: HOW IT IS CAUSED, HOW IT CAN BE PREVENTED."

To the Editor of The Lancet.

Sir,—With reference to your comments on a letter, with this title, in your issue of July 19th concerning the incidence of cancer in uncivilised races, my surgical work for the past 22 years has lain in the Punjab amongst a people primitive as to their diet, though I should hesitate to describe them as uncivilised. An inquiry into the prevalence of cancer amongst this people conforms with some of the statistical postulates contained in your note: (1) Is known accurately. (2) Sufficiently accurately for a comparison of the sort in view. (3) The annual reports of the Inspector-General of Civil Hospitals, Punjab, deal with over 6,000,000 attendances of out-patients, and operations run to a quarter of a million yearly. A large proportion of the total number of these operations are for the relief of senile cataract, so it is unnecessary to labour the point that many people survive until the "cancer age." (4) A large number of post-mortem examinations are held in Government mortuaries in criminal and police cases. Facilities exist for microscopical examination of morbid tissues.

The diet of this people is, I think, worthy of attention. It is very simple, and owing to caste injunctions and inhibitions and economic causes very constant—probably the diet of no people in the world varies less from that of their ancestors of 6000–8000 years ago. Briefly, it consists of lightly scorched unleavened bread, made from a dough of wholemeal stone-milled unsifted flour into flat cakes about the size and shape of our pancakes. This "bread" is eaten with dâl, a sort of pulse, or with curried vegetables, and large quantities of cellulose are taken in the form of raw radishes, sugar-cane, cucumber, and raw fruit, according to the season. The peasants also drink quantities of milk as they are great breeders of buffaloes and kine. With them bread *is* the staff of life; this coarse, whole-meal, unleavened bread and dâl is the daily fare of millions from the time they leave their mothers' breasts until they die. They have magnificent teeth and are usually of fine physique; to see a crowd of Sikhs stripped to their loin-cloths for a village faction fight is a sight for sore eyes.

Finally, they appear to be singularly immune to cancer in any of its forms. The kangri cancer described by Neave in Kashmir I have never seen in the Punjab, though severe scarring from burns is common. I have never seen a case of betel-nut cancer, such as described by Spittle in Colombo, and by others in Southern India, though the practice of chewing betel-nut is common in the Punjab. I have never seen a case of cancer of the penis, though I have frequently had to amputate the entire organ while in the Himalayas for ulcerating granuloma of the pudenda; none of these proved to be cancerous on microscopical examination. In the course of my 22 years' service I must have made many hundreds of post-mortem examinations, but I have never come across a case of latent cancer. I cannot remember a case of cancer of the tongue in the whole of my 22 years' service. It must be distinctly understood that the foregoing statements apply only to the unsophisticated Punjabi and Himalayan villager, who cultivates his own fields—not to the upper and educated classes or even to the lower orders of the large towns.

It is difficult to avoid the conclusion that cancer is relatively uncommon in this class of the population, though cancer in all its forms is frequent amongst Europeans and Anglo-Indians in India.

I am, Sir, yours faithfully,
H. HALLILAY,
Lieut.-Col., I.M.S.; late Civil Surgeon, Simla.
August 14th, 1924.

FUNDAMENTAL CANCER RESEARCH.

To the Editor of THE LANCET.

SIR,—I have read with interest in your issue of August 9th a reference to the fourth instalment of the summaries issued by the Departmental Committee on Cancer and sent out by the Ministry of Health, but I think that the statement made by the Committee that "No constant signficant differences [in cancer metabolism] have been discovered" is too sweeping, and is not borne out by the work that has been done in the research department of the Glasgow Royal Cancer Hospital.

Thirteen years ago[1] I published a paper upon the Rôle of Fat in the Ætiology and Progress of Cancer, and in that I pointed out that a large increase of the unsaturated fatty acids takes place in cancer patients, the percentage rising from 62·1 in health to 72·6 in that disease. Further investigations upon this point have been conducted by Mr. A. N. Currie, biochemist in the research department, who has recently published an article[2] on the Fat of Adipose Tissue in Malignant Disease. In it he not only confirms the presence of an excess of unsaturated fatty acids, but he has shown that this excess is more marked in the vicinity of the cancerous tumour than elsewhere. Further, his paper brings out that there is a qualitative difference in the fat of the cancerous patient compared with that in health. Not only is the unsaturation of the fat more marked, but there is a difference in its pigmentary constituents. It is not easy to say what exactly this unsaturation indicates, but of its presence there can be no doubt; so that, on these grounds, I think that it is scarcely correct to say that no constant significant differences have been discovered.

One possible explanation of this condition is that a local enzyme may be the cause of this unsaturation, so that the fat may form an easier pabulum for the cancerous growth. Of the great emaciation that marks the condition of the cancerous patient in the last stages of the disease, the cases in the Glasgow Royal Cancer Hospital afford ample proof, and they are a striking example of the marked change in the body metabolism when cancer is present.

I am, Sir, yours faithfully,
GEORGE THOS. BEATSON, M.D.
Woodside-crescent, Glasgow, W., August 12th, 1924.

PAROXYSMAL RHINORRHŒA AND BRONCHIAL ASTHMA CAUSED BY STRAW.

To the Editor of THE LANCET.

SIR,—Though it is probable that several different conditions are still included under the term bronchial asthma, much has been learned of its ætiology, especially in relation to anaphylaxis. It is sometimes possible to identify the antigen so definitely that we may successfully screen the patient from contact with it.

A clerk, aged 19, had suffered only from the usual infections of childhood and never experienced any symptoms relating to the nose or lungs until two years before coming under our observation. It was then that he was engaged to work at an ironmonger's store. He soon found that almost every day he had sudden attacks of nasal obstruction, with a watery secretion and much sneezing. At the same time he became short of breath, even when he was at rest. Itching macules often appeared on his arms if he left them bare. Whenever he was away from the store, as on Sundays and holidays, he was free from attacks. When at length he came under our observation and was closely questioned, it became evident that attacks only occurred when he had unpacked china packed in straw. On physical examination he appeared strong and the heart and lungs were normal. The mucosa of the inferior conchæ of the nose was hypertrophied.

Some of the straw used in packing was extracted with decinormal sodium hydrate. With the extract a cutaneous reaction was performed on the ulnar side of the forearm. In five minutes a vesicle appeared 5 cm. higher up the forearm and soon became large. The patient declared that it was like the vesicles he was wont to get. No other eruption appeared, not even on the spot where he was scratched. With his permission we inserted into one of his nostrils a pledget of cotton-wool steeped in the straw extract. In 5–10 minutes a severe paroxysm of rhinorrhœa began, with swelling of the mucosa, watery secretion from the nose and the conjunctivæ, itching, and sneezing whereby the cotton-wool was blown out. The attack was over in a few minutes, and asthma did not occur, perhaps because the cotton-wool had come away.

He was excused from the work of unpacking and no further attacks have occurred except on two or three isolated occasions when he has had to do this particular work.

We are, Sir, yours faithfully,
G. FLÖYSTRUP, M.D.
Copenhagen, August 16th, 1924. JENS KRAGH, M.D.

THE GROWTH OF OCCUPATIONAL HYGIENE.

To the Editor of THE LANCET.

SIR,—The figures given by Mr. A. H. Southam and Dr. S. R. Wilson of the large number of mule-spinners treated for scrotal epithelioma in the Manchester Royal Infirmary, followed by Dr. S. A. Henry's inquiry into the distribution of these cases in the cotton mills of Oldham (59), Bolton (21), Preston (17), Blackburn (14), and other Lancashire towns in smaller number, has led to a startling result. A case was brought in a Lancashire court, and, after being argued fully, £2000 was awarded by the judge in compensation. Naturally the decision has created great interest in Lancashire. The case will probably go to the High Court, where we shall be told whether this decision will stand or not. But as it stands the result of a piece of careful clinical research on industrial life is already great. Such a decision, if upheld, should do much to encourage all those who, throughout the country, are striving to prevent disease. Some day we may get a method which will decisively link a case of pulmonary tubercle to the house in which it was contracted. Then, if the house was provided for him by an employer and if the judge can be persuaded that the man thus became infected in the course of his employment, compensation will become payable to the patient or his representative. This will become a haunting fear for employers of labour, of domestic servants, of sailors, even of soldiers, all of whom will then begin to do their best to avoid for their employees the risks which medical officers of health have long been forecasting. These officers should find that their proposals are received in future with more cordiality than hitherto they have experienced, once it becomes realised that a subsequent scientific discovery may involve back payment of compensation, if it succeeds in explaining the origin of a disease to-day thought to be constitutional as really depending definitely on employment. It looks as though the time may be coming when employers will come and beg the medical officer of health to tell them what more they can do to keep their men healthy.

I am, Sir, yours faithfully,
SPERO DUM SPIRO.
August 18th, 1924.

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[1] THE LANCET, 1911, i., 1560.

[2] Jour. of Pathology and Bacteriology, 1922, vol. xxv.

Obituary.

GEORGE HEATON, M.B. OXF., F.R.C.S. ENG.

THE sudden death of Mr. George Heaton, honorary surgeon to the General Hospital, Birmingham, at the age of 63, has caused the deepest regret not only to members of the medical profession in the Birmingham district, but to a large number of private friends and past patients. Mr. Heaton was educated at Clifton School, of which he became head boy, and proceeded thence to Oxford with a demyship to Magdalen, where he attained a first class in the Natural Science Tripos. He then became a student at St. Bartholomew's Hospital, where he had a brilliant career, winning the Senior Entrance Scholarship, the Brackenbury, and the Lawrence Scholarship and Gold Medal. He qualified M.B., Ch.B. in 1888 and became house surgeon to Mr. Willett. In 1890 he was elected resident surgical officer to the General Hospital, Birmingham, and so returned to his native city. This post is usually a stepping-stone to membership of the staff of the hospital, and so it proved in Heaton's case, but whilst holding it he suffered the misfortune of an infected wound, which threw a shadow over the rest of his life, and in some degree lowered his general health and vitality, so that he always carried on his work with a certain reserve, and his early brilliant promise was not fulfilled as it would have been under other conditions. Elected to the staff of the General Hospital as assistant surgeon in 1891, he became surgeon in 1894 at the unusually early age of 33, in some ways a fortunate circumstance for him as he had the opportunity of developing a dexterity in operative work not so easy to acquire at a period, say, ten years later. By the laws of the hospital members of the staff have to retire at the age of 60, or when they have held office for 25 years. As a result Heaton was retired at the age of 58, in the fullness of his power, a real loss to the service of his hospital. In addition to being a clinical lecturer in the University, in his earlier days he was demonstrator of surgical pathology, assistant to the chair of surgery, lecturer in operative surgery for 11 years, and a clinical examiner in surgery.

Apart from the run of general surgical work, Heaton was more attracted to abdominal surgery than to other fields, and he published several valuable papers on abdominal work. He was a very good diagnostician, a careful and skilful operator, concerned above all things in bringing his patient safely through his ordeal, never sacrificing safety to some brilliant ideal with attendant greater risks. As a teacher he was thoroughly sound, clear, and concise—painstaking to a degree. His alma mater recognised his worth by making him an examiner in surgery at Oxford. Heaton took his share in all that concerned the medical life of the city, the medical societies, and the Medical Institute, but always his greatest interest was in the hospital which he served so well, and when he retired he received a presentation of silver from those intimately acquainted with the work of the institution. He was always a most excellent colleague, but he often held views with tenacity, and argued stoutly for them. Once an adverse decision had been arrived at, however, he loyally accepted it, and there was no loss of harmony. He will long be kindly and affectionately remembered by those with whom he worked, in whatever capacity they served.

His unexpected death followed a prolonged attack of phlebitis, from which he appeared to have recovered as he had partly resumed active life again.

ANDREW SMITH M.D. EDIN.

THE sudden death occurred from syncope on August 1st of Dr. Andrew Smith, of Whickham, Durham. Born in Leven, Fifeshire, he received his medical education at the University and at the Royal College of Surgeons of Edinburgh, and graduated M.B. with honours at the University in 1876, obtaining the M.D. five years later. He took up practice on qualification at Whickham, where in the following years he built up an extensive practice and won the respect and esteem of a large circle in the district. He kept himself abreast of medical progress and was a prominent figure in all local medical societies, having for a time held the office of President of the Northumberland and Durham Medical Society, also of the Newcastle-on-Tyne Clinical Society, and when these two amalgamated as the Newcastle-on-Tyne and the Northern Counties Medical Society he retained an active interest in their work. He was a member of the Society of Medical Officers of Health, and had acted as President of the Northern branch, and was medical officer of health to the Whickham Urban District Council until his death. He was keenly interested in the ambulance movement, and to his practical help the Whickham District War Memorial Hospital owes in no inconsiderable extent its foundation, while under his guidance as hon. medical officer the hospital became a thoroughly up-to-date and valuable institution. Dr. Smith was a prominent figure in the British Medical Association, of which he was a member for 41 years, and filled successively the offices of chairman of the Newcastle-on-Tyne division and President of the North of England Branch. Dr. Smith was also for a time President of the Edinburgh Graduates' Association in Newcastle. He leaves a widow and a family of four sons and three daughters. Three of his sons are in the medical profession and assisted their father in his practice. To his family we express our heartfelt sympathy in their loss.

CHARLES RITCHIE NIVEN, M.B., C.M. GLASG.

Charles Ritchie Niven, who died from heart failure at his residence, Everton, Liverpool, on Monday, August 18th, was 62 years of age. He qualified at Glasgow in 1888 and went to Liverpool 30 years ago. For the last three years he had been honorary secretary of the Liverpool Panel Committee. Dr. Niven was the founder and a very active worker in connexion with the Everton and District Medical Association. He leaves a widow and two daughters.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. W. H. Butcher to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Col. J. C. Connor, on attaining the age limit for compulsory retirement, is placed on retd. pay.

The undermentioned Lts. are confirmed in their rank: C. R. Christian, R. J. Rosie, J. Huston, and E. G. Dalziel from Gen. List, T.A.

ARMY RESERVE OF OFFICERS.

Col. E. M. Morphew, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

F. C. Lewis to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. F. Evans (late R.A.M.C., T.F.) to be Capt.

FOREIGN MEDALS.

The following have received from the President of the French Republic medals for services rendered during the war:—

Médaille de la Reconnaissance Française.

En Argent.

Captain Alfred Sigismund Bruzaud, R.A.M.C. (T.F.) (now retired, Territorial Army); Temporary Captain Simon John Coulter Fraser, R.A.M.C.; Temporary (Honorary) Major Louis Francis Knuthsen, R.A.M.C.; and Quartermaster and Captain John Hannaford Maunder, R.A.M.C. (Territorial Force).

En Bronze.

Captain Lionel Thomas Challenor, R.A.M.C. (T.F.); Temporary Captain Richard Bertram Johnson, R.A.M.C.; and Temporary Captain Frederick Alexander Ross, R.A.M.C.

a difficult abdominal operation. He obtained apparently excellent relaxation by this means. The anæsthetist was completely under his control, moving the indicator on the machine according to directions. This demonstration was a pleasure to watch, and the surgeon was an expert, not only at his own job, but as an anæsthetist. He realised the supreme importance of gentleness in handling the parietal peritoneum, and during the whole operation never made a single rough or unnecessary movement. There was a supply of ether in the bottle attached to the machine, but it was not used.

I saw very few students giving anæsthetics under tuition, and these were chiefly in Canada. The so-called interns, corresponding to our house officers, do comparatively very little anæsthetic work. There is, in fact, not the same reason for them to do so, as all surgery is done in hospital to which there is attached a team of full-time salaried assistants.

AN ASEPTIC METHOD OF TYING SUTURES.

IN a recent number of the *Medizinische Klinik* Dr. Franz Weigl, of Vienna, describes a useful practical method of tying sutures without touching the material with the fingers. The advantages of such a procedure are obvious where the surgeon is chary of risking sepsis by handling the wound at the end of the operation. The method, which is very simple and which enables the knot to be tied just as quickly as by hand, is as follows: After the needle in the needle-holder has been passed through the edges of the wound the end of the suture, A, is grasped by a pair of artery forceps. The needle is removed from the suture by the needle-holder and laid aside, then the end A, which is held by the artery forceps, is twisted once round the needle-holder (Fig. 1). The needle-holder then picks up the other end of the suture (B, Fig. 2). While the artery forceps maintains its grip of end A the needle-holder containing end B is withdrawn through the loop, the whole is pulled tight, and in this way the first tie of the knot is made. Then end A is released by the artery forceps and the end B twisted round the artery forceps, which now seizes end A, draws it through the loop, and thus completes the knot.

FIG. 1.

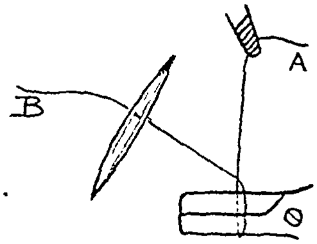
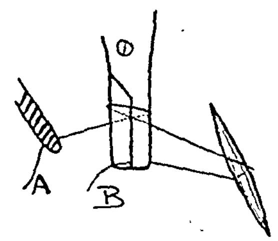


FIG. 2.



SANTONIN IN HOOK-WORM DISEASE.

AN OFFER.

To the Editor of THE LANCET.

SIR,—In a leading article on anthelmintics in your issue of July 19th you state that it is probably the economic factor which has prevented the trial of santonin in the treatment of hook-worm disease, and the absence of reports of its action on these parasites is to be regretted. We share your desire to advance scientific research in reliable anthelmintic medicines. Considering the efficacy of santonin against other nematodes, it would be of great interest to have reliable reports of its action on hook-worms. Being sole distributors of santonin and genuine Russian wormseed containing santonin, we beg to inform you herewith that we are prepared to supply interested scientific institutions with such quantities of santonin as they may require for research purposes free of all charge.

We are, Sir, yours, faithfully,
THE EASTERN AND RUSSIAN TRADING COMPANY, LTD.
8, Drapers-gardens, London, E.C.2, August 19th, 1924.

URGENT TELEPHONE CALLS.

To the Editor of THE LANCET.

SIR,—Under this heading in THE LANCET of August 16th your correspondent, "F. W. W.," rightly points out the ambiguity, when taken alone, of the wording at page 4 of the directions for a fire, ambulance, and police emergency call, as given in the London Telephone Directory. These directions, however, end, as "F. W. W." observes, with the sentence "(see Instructional headlines)." If "F. W. W." turns to page 316 he will find under "Fire Brigade" as follows: "In case of Fire call Fire Brigade: no number is required. When Fire Station replies, give address of Fire." Again, on the front, outside covering leaf of the current issue of the Directory, will be found similar instructions, as follows: Call "Fire Brigade," no number required. "When Fire Station replies, give address of fire." From this, it is seen that, in the call, no number whatever is required to be given, but merely the address of place where the fire has occurred. This should be given by the caller to the officer replying from the fire headquarters station, who will then communicate and send on aid from the nearest district fire station.

Whilst on the question of fire prevention I may, perhaps, here mention another important failing, as showing the supreme ignorance of the public in most matters connected with fires—namely, the whereabout of the nearest street fire-alarm to their premises, and how effectively to call up the fire brigade by 'phone. The third failing I refer to is to the effect that, in my experience, few workers or residents give any thought whatever, until a fire actually occurs, to means of escape in such an emergency. As suggested by me in my Warnings against Fire, "It is too late to begin making inquiries when the building is in flames." In connexion with this matter, in giving evidence before the recent Royal Commission on Fire Prevention, I pointed out that, on an average, in every third fire inquest in the City of London, the jury, after a careful personal inspection with experts of the premises, found that the means of escape from fire was inadequate, and fell short of the requirements of the London Building Acts.

I am, Sir, yours faithfully,
F. J. WALDO.
H.M. Coroner for the City of London and Southwark.
August 18th, 1924.

GRATUITOUS MEDICAL ATTENDANCE.

To the Editor of THE LANCET.

SIR,—The profession know only one rule—*not* that of the highwayman, "Your money or your life"—but simply *service*.

My rule is not to charge a fee to any member of the profession (including dentists), his wife, or unmarried daughter.

The clergy should be charged. Because they are poor, marriage is not imperative; they must shoulder the burden of responsibility. The poor clerk, the poor tradesman, the poor professional man, is usually dealt with according to his necessity—the clergy may be no better off, but they are not worse.

When ecclesiastical incomes become proportionate to services rendered, and cathedral dignitaries cease to receive much for very little, *our* hard-worked profession may then consider doing something for nothing for this particular class of professional man.

I am, Sir, yours faithfully,
W. B. COSENS.
Dorchester, August 16th, 1924.

To the Editor of THE LANCET.

SIR,—I always understood that it would be considered unprofessional to charge a doctor or his family for attendance.

Unfortunately my wife had to undergo a gynæcological operation some time ago, which was performed by one of two local men.

In thinking the matter over, I decided to call upon the operator and offer him some kind of a fee as an acknowledgment of his kindness. I was saved this trouble, however, for, before my wife was even sitting up, I received a letter asking for 22 guineas—half fees, he stated—so that I should not be under the necessity of making him a present!

I sent him a cheque by return and placed his letter on the receipt file of tradesmen's bills. Could I have done otherwise? I enclose my card.

I am, Sir, yours faithfully,
CONTEMPT.
August 18th, 1924.

VIBRATORY MASSAGE DE LUXE.

To the Editor of THE LANCET.

SIR,—During the holiday overhauling of London streets there is to be seen this year in large numbers a vibratory apparatus of herculean proportions used for breaking up the concrete of the road—and very efficiently it does its work. What the effect of the noise and vibration has upon the men who wield these things can hardly be imagined, but the vibration is such as to be exceedingly irksome to the passer-by and to residents within 40 or 50 yards of the spot. Has the human element in this business been tested? or are we to wait until clinical notes of functional disorder appear in medical journals and the text-book of industrial medicine records in a few years' time a new occupational disease? Is there no official medical department which can assure the citizen of sensitive conscience that these men are not doing themselves grievous bodily harm in the interest of a community desirous of speeding up its lines of communication?

I am, Sir, yours faithfully,
B.Sc.
August 18th, 1924.

STUDENTS' GUIDE—SESSION 1924-1925.

THE scheme upon which the Students' Number of THE LANCET is constructed will make it easy, we hope, for all who consult it to find what they seek. The General Council of Medical Education and Registration is the controlling authority of all the medical and dental education of the country, and its responsibility for the upkeep of the Medical Register and for the maintenance of the examination standard is first explained. But the student has to be taught as well as examined, and as the systems under which instruction can be obtained do not conform to one pattern, the various curricula are described in detail, and under their respective headings the necessary information will be found concerning the facilities for medical study offered at the different teaching centres of the United Kingdom. The regulations for the examinations, both preliminary and professional, at these centres are set out so that the student desiring to obtain a medical degree from any university, or a diploma from any medical corporation, may ascertain the course of clinical instruction and the conditions under which submission for examination has to take place. The metropolitan medical schools and hospitals are grouped under the University of London, of which they are constituent bodies, although their educational opportunities are offered to students of other universities as well as to those seeking the qualifications of the medical corporations. A similar plan is adopted in dealing with the provincial universities, the hospitals in direct connexion with which are described with the universities; the hospitals may not be official schools of the universities, but they supply an integral section of the teaching required.

Upon securing degrees or diplomas admission to the Register follows, and greater education begins. The prudent young doctor already knows what he or she desires to make the next step, and there is a large range of choice displayed. The inducements to enter one of the Services should prevail more than they have done of recent years. An account is given of the conditions under which commissions can be obtained in the Navy, Army, Indian, and Air Force Medical Services, and in the Colonial Medical Service.

GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

POWERS, DUTIES, AND CONSTITUTION OF THE GENERAL MEDICAL COUNCIL.

THE powers and duties of the General Medical Council, or "General Council of Medical Education and Registration of the United Kingdom" to give the Council its full title, have been set out in detail in many previous Students' Numbers of THE LANCET. It is first a registering body: no person, even though his qualifications have been obtained by examination, is a legally qualified medical practitioner until his name appears on the Medical Register. Secondly, it is a standardising body, ensuring that medical education reaches an efficient standard by scientific examination. Thirdly, it is a penal and disciplinary body, having power to remove from the Register any practitioner adjudged guilty of conduct "infamous in a professional respect." Fourthly, to the Council is committed the codification of pharmaceutical remedies. The duties of the Council are thus primarily of a public nature, and its construction shows its fitness for its fourfold responsibilities.

The Council at present consists of 38 members, of whom, as will be seen by the annexed list, all but 11 are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council, and six others are elected by the members of the medical profession as Direct Representatives. There are also three additional members appointed by the Privy Council under the Dentists Act, 1921, under which the powers and duties of the General Medical Council with regard to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the Dental Board of the United Kingdom (see p. 477).

President of the General Council: Sir Donald MacAlister. Members of the General Council: Sir Humphry Rolleston, chosen by the Royal College of Physicians of London; Mr. H. J. Waring, F.R.C.S., Royal College of Surgeons of England; Dr. Benjamin Bloomfield Connolly, Apothecaries' Society of London; Mr. Arthur Thomson, F.R.C.S., University of Oxford; Dr. Wynfrid Laurence Henry Duckworth, University of Cambridge; Dr. Robert Howden, University of Durham; Sir Sydney Russell-Wells, University of London; Dr. Robert B. Wild, Victoria University of Manchester; Sir Gilbert Barling, University of Birmingham; Dr. Richard Caton, University of Liverpool; Dr. Thomas Wardrop Griffith, University of Leeds; Mr. John Beresford Leathes, M.B., University of Sheffield; Sir Isambard Owen, University of Bristol; and Dr. David Hepburn, University of Wales. Dr. William Russell, chosen by the Royal College of Physicians of Edinburgh; Sir James Hodsdon, Royal College of Surgeons of Edinburgh; Dr. James Alexander Adams, Royal Faculty of Physicians and Surgeons of Glasgow; Dr. H. Harvey Littlejohn, University of Edinburgh; Sir Donald MacAlister, University of Glasgow; Dr. Matthew Hay, University of Aberdeen; and Dr. John Yule Mackay, University of St. Andrews. Sir John William Moore, chosen by the Royal College of Physicians of Ireland; Sir Arthur Gerald Chance, Royal College of Surgeons in Ireland; Dr. Edward Magennis, Apothecaries' Hall of Ireland; Dr. Andrew Francis Dixon, University of Dublin; Dr. Denis Joseph Coffey, National University of Ireland; and Mr. Thomas Sinclair, F.R.C.S., Queen's University of Belfast. Nominated by His Majesty, with the advice of his Privy Council: Sir Francis Henry Champneys, Sir George Newman, Sir Nestor Tirard, Sir Leslie Mackenzie, and Sir Edward Coey Bigger. Elected as Direct Representatives: Dr. J. A. MacDonald, Sir Thomas Jenner Verrall, Dr. Robert A. Bolam, Mr. E. B. Turner, Sir Norman Walker, and Dr. Leonard Kidd. Treasurers of the General Council: Mr. H. J. Waring and Sir George Newman. The three additional members are Mr. William Henry Dolamore, M.R.C.S., L.D.S.; Mr. William Henry Gilmour, M.D.S., L.D.S., and Mr. William Guy, F.R.C.S.E., L.D.S.

THE EDUCATIONAL CURRICULUM.

Professional Education.—The course of professional study after registration occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

The following are the General Medical Council's Regulations in regard to the registration of medical students which came into force on Jan. 1st, 1923.

Registration of Medical Students.

1. Subject to such exceptions as the Council may from time to time allow, every medical student, at the commencement of his studies, should be registered in the manner and under the conditions hereinafter set forth.

2. Before registration as a student every candidate should produce evidence that he has attained the age of 17 years.

3. The minimum standard of General Education required is that of University matriculation or entrance examination in the Faculties of Arts or Pure Science.

4. Before registration as a student every applicant should be required to have passed an approved examination in general education, and, in addition thereto, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.

5. A student who has diligently attended an approved course of instruction in elementary biology at a secondary school or other teaching institution recognised by a licensing body may be admitted to the professional examination in elementary biology immediately after his registration as a student.

6. The commencement of the course of professional study recognised by any of the licensing bodies should not be reckoned as dating earlier than 15 days before the date of registration.

7. Every person desirous of being registered as a medical student should apply to the registrar of the division of the United Kingdom in which he is residing, according to a prescribed form, copies of which may be had on application to the several licensing bodies, medical schools, and hospitals, or at the offices of the Medical Council; and should produce or forward to the registrar evidence that he has attained the age of 17 years, that he has passed a preliminary examination in general education recognised by the General Medical Council, and, in addition, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies, and that he has commenced medical study.

Regulations which the Council has prescribed for the maintenance of the register of medical students:—

1. It shall be delegated to the Education Committee to prepare and issue from time to time a list of examining bodies whose examinations in general education fulfil the conditions of, and are specially recognised by, the General Medical Council.

2. The Council has recognised the undernoted university examinations, subject to the conditions specified below: viz., at Oxford University, Responsions; at Cambridge University, the Previous Examination; at the Scottish Universities, the Preliminary Examination; and the Matriculation Examination at the Universities of Birmingham, Bristol, Durham, Leeds, Liverpool, London, Manchester, Sheffield, and Wales.

3. The conditions prescribed by the Council are:—(1) The standard of the examination shall not be lower than that of the University Matriculation Examinations in the Faculties of Arts and Pure Science. (2) The certificate shall bear evidence that the candidate has passed in the following subjects, viz.:—(*a*) English. (*b*) Mathematics, Elementary. (*c*) A language other than English. (*d*) An additional subject or subjects, as required by the regulations of the particular examination, to be chosen from the subjoined list, viz.: History, Geography, Physical Science, Natural Science, Latin, Greek, Hebrew, French, German, or other language accepted by the University for the purpose.

4. Subject to the conditions specified above (Section 3, Subsection (2)), the Council will recognise all examinations conducted by recognised authorities in Great Britain accepted by one or more of the above-named Universities as equivalent for purposes of Matriculation to an examination named in the preceding list (Section 2). Bristol University: Higher School Certificate Examination; Schools Certificate Examination. Cambridge Local Examinations and Lectures Syndicate: Higher School Certificate Examination; School Certificate Examination. Central Welsh Examination Board: Senior Certificate Examination. Durham University: Higher Certificate Examination; School Certificate Examination. London University: General School Examination; Higher School Certificate Examination. Northern Universities Joint Matriculation Board: Higher Certificate Examination; School Certificate Examination. Oxford and Cambridge Schools Examination Board: Higher Certificate Examination; School Certificate Examination. Oxford Delegacy for Local Examinations: Higher School Certificate Examination; School Certificate Examination. Scottish Education Department: Leaving Certificate Examination.

5. The Council will continue to recognise examinations conducted by educational bodies other than those (referred to in Section 4) directly recognised by the Universities of Great Britain. Recognition will not be extended under this section to any examination unless the Council is satisfied (1) that in scope and standard it is equivalent to a recognised Matriculation Examination of a British University, and (2) that it fulfils the conditions specified by the Council (Section 3, Sub-section (2)). Such examinations are:—The College of Preceptors (England): Senior Certificate. The Educational Institute of Scotland: Preliminary Medical Certificate.

Examinations in Ireland.—6. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise the Entrance Examination to the School of Physic of the University of Dublin, the Matriculation Examinations of the National University of Ireland and the Queen's University of Belfast, the Preliminary Examination of the Irish Royal Colleges of Physicians and Surgeons, and the Senior Grade Intermediate Certificate of the Ministry of Education, Belfast, and all examinations accepted by one or more of these bodies as equivalent for purposes of entrance or Matriculation, to the above-named examinations.

7. The Council will recognise the Final Examinations for Degrees in Arts and Science of any University of the United Kingdom or of the British Dominions.

Colonial Examinations.—8. Subject to the specified conditions (Section 3, Sub-section (2)), the Council will recognise all examinations of Colonial Universities which are accepted by one or more of the British Universities as equivalent, for purposes of Matriculation, to an examination named in the list of examinations recognised by the Council (Section 2).

The registration of medical students is placed under the charge of the Branch Registrars.

A copy of the Medical Students Register prepared by each of the Branch Registrars is transmitted, on or before Dec. 31st in each year, to the Registrar of the General Council, who supplies an alphabetical list of all students registered in the preceding year to each of the licensing bodies in the United Kingdom, and to each of the several medical schools and hospitals.

All applications for special exceptions to the foregoing regulations as to registration should be addressed to the Registrar of the General Council.

Lists of Universities (including their Colleges and Medical Schools) and Schools of Medicine at which Medical Study may be Commenced in the United Kingdom.—1. Universities (including their colleges): Aberdeen University; Belfast, Queen's University; Birmingham University; Bristol University; Cambridge University; Dublin University (including Trinity College); Durham University (including the Durham College of Medicine); Edinburgh University; Glasgow University (including Queen Margaret College); Ireland, National University (including University College, Cork; University College, Dublin; University College, Galway); Leeds University; Liverpool University; London University (including the following Schools and Colleges: St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College, King's College Hospital, London Hospital, St. Mary's Hospital, Middlesex Hospital, St. Thomas's Hospital, University College, Westminster Hospital, London (Royal Free Hospital) School of Medicine for Women; Bedford College, Royal Holloway College); Manchester, Victoria University; Oxford University; St. Andrews University (including University College, Dundee); Sheffield University; Wales, University of (including University College of Wales, Aberystwyth; University College of North Wales, Bangor; University College of South Wales and Monmouthshire, Cardiff; Welsh National School of Medicine, Cardiff; University College, Swansea). 2. Schools of Medicine Recognised by the Licensing Bodies:—Dublin: Royal College of Surgeons, Schools of Surgery; Edinburgh: School of Medicine of the Royal Colleges; Glasgow: Anderson's College, St. Mungo's College.

The address of the Registrar, to whom further communications should be addressed, is as follows: The Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1.

THE MEDICAL EXAMINING BODIES AND SCHOOLS OF THE UNITED KINGDOM.

A Guide to the Facilities for Obtaining the Various Medical Degrees and Other Qualifications for the British Medical Register.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

UNIVERSITY OF OXFORD.[1]

This University confers two degrees in Medicine, those of *B.M.* and *D.M.*, two in Surgery, *B.Ch.* and *M.Ch.*, and diplomas in *Public Health and Ophthalmology*.

Only Graduates in Arts of the University are eligible for the Medical and Surgical degrees. The most convenient course for the B.A. degree for intending graduates in Medicine is to take Responsions, the Preliminary Science Examinations mentioned below, and the Final Honour School of Physiology. To obtain the degrees of B.M. and B.Ch. the following examinations must be passed: 1. Preliminary subjects: Physics and Chemistry, Zoology, and Botany. 2. Professional. (*a*) First Examination: Subjects—Organic Chemistry, unless the candidate has satisfied the examiners in Part I. Chemistry in the Honour School of Natural Science; Human Physiology, unless he has obtained a First or Second Class in Animal Physiology in the Honour School of Natural Science: Human Anatomy. (*b*) Second Examination: Subjects—Medicine, Surgery, Midwifery, Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology. The First and Second Professional examinations are held in June and December. The first B.M. examination may be passed at any time after the Preliminary Scientific examinations. Anatomy and Physiology must be passed at the same time—Organic Chemistry may be taken separately.

At any time after passing the First Examination, the candidate can, on producing certificates, present himself for examination in the subjects of Pathology, Forensic Medicine with Hygiene, Materia Medica and Pharmacology; but cannot enter for examination in Medicine, Surgery and Midwifery until the eighteenth term from his matriculation, nor until a period of at least thirty-three months has elapsed from the date of passing the First B.M. Examination. He must pass in Medicine, Surgery and Midwifery at one and the same time.

Before admission to the Second B.M. Examination, the student must produce certificates of having attended laboratory courses in Pathology, Bacteriology and Pharmacology either in Oxford or in a recognised medical school. He must also produce certificates of having acted as Clinical Clerk and Dresser, each for six months, in a medical school approved by the University, of three months post-mortem clerking, of attendance on Labours, of instruction in Infectious Diseases and Ophthalmology, and of proficiency in vaccination and the administration of anæsthetics.

The degree of B.Ch. is granted with that of B.M. after passing the above examinations. The degree of D.M. is granted to Bachelors of Medicine of the University who have entered upon their thirtieth term from Matriculation, and have submitted a dissertation which is approved by the examiners for the B.M. degree whose subjects are dealt with therein and by Professors in the Faculty of Medicine. The degree of M.Ch. is granted after examinations to Bachelors of Surgery in the University who have entered upon their twenty-first term, and who are Members of the Surgical Staff of a recognised hospital, or have acted as Dresser or House Surgeon in such a hospital for a period of six months. The examination, which includes Surgery, Surgical Anatomy and Pathology and Surgical Operations, is held annually in June, after the Second B.M. examination.

The examinations for the Diploma in Public Health[2] in two parts are held in Trinity and Michaelmas terms; that for the Diploma in Ophthalmology is held annually, commencing on the third Monday in July.

For the Diploma of Ophthalmology attendance at a course of instruction in Oxford, lasting two months, and at approved courses of instruction in Clinical Ophthalmology during twelve months, is obligatory. Candidates must be registered medical men, unless, being Bachelors or Doctors of Medicine of Universities outside the United Kingdom, they have obtained special permission from the Board of the Faculty of Medicine.

Travelling Fellowship, Scholarships, and Prizes.—A Radcliffe Travelling Fellowship is awarded annually after an examination held in February. It is tenable for two years and of the annual value of £300. The examination is in Physiology, Pathology, and Hygiene, and is partly "practical." Candidates must be graduates in Medicine of the University. The holder must travel abroad for the purpose of medical study. Application should be made to the Radcliffe Examiners, Department of Medicine, University Museum. A Christopher Welch Scholarship of £100, tenable for four years, is awarded annually after examination. Candidates must be men undergraduate members of the University, who have not exceeded the twelfth term from their matriculation, or been admitted to any degree in the University. They may offer any one of the subjects. Animal Physiology, Botany, Zoology. A Rolleston Memorial Prize is awarded once in two years to members of the Universities of Oxford and Cambridge of not more than ten years' standing for an original research in some Biological subject, including Physiology or Pathology. The Radcliffe Prize, founded by University College (1907), is of the value of £50 and is awarded biennially (alternating with the Rolleston Memorial Prize) for research in some branch of medical science. The Theodore Williams Scholarships, each of the value of £50 a year for two years, are awarded annually in the subjects of Anatomy, Physiology, and Pathology. A Radcliffe Scholarship in Pharmacology, of the value of £50 for one year, is awarded annually by the Master and Fellows of University College. A King's College Hospital Burney Yeo Scholarship of £80 is awarded each year. The Scholarships and Exhibitions in Science which are offered by most Colleges are open to those who intend to pursue Medicine. The value of these scholarships is usually £80 a year for four years; the exhibitions vary in value from £30 to £90 per annum. The number of scholarships and exhibitions in Science offered annually is about forty. There are also Medical Scholarships of the value of £100 a year at University College and at Pembroke College. The Welsh Memorial Prize for Anatomical drawing is awarded annually, and is of the value of about £10.

In addition to the University Lectures and classes the several Colleges provide their undergraduates with tuition for all examinations up to the B.A. degree.

In the Radcliffe Infirmary and County Hospital elementary clinical instruction is given by the Regius Professor of Medicine, the Litchfield Lecturers in Medicine and Surgery, and the other physicians and surgeons. Instruction is also given in post-mortem work and Clinical Pathology in connexion with the courses in Pathology. Post-graduate courses are held at the beginning of October.

More detailed information may be obtained from the University Calendar; from the Examination Statutes, 1923 (both of which are published by the Clarendon Press); from the Regius Professor of Medicine; from the Professors in the several departments of medical science; and from the Dean of the School of Medicine, Department of Medicine, Museum, Oxford.

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[1] Vide "Information concerning the School of Medicine, Medical Degrees and Diplomas, and Post-Graduate Medical Study and Research." Oxford, at the Clarendon Press, 1s. net.

[2] The regulations for the Diplomas in Public Health of the various Examining Bodies will be found on page 472.

University of Oxford: Radcliffe Infirmary and County Hospital.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. The hospital contains 210 beds. In connexion with the hospital there is usually held in each year during October a post-graduate course, lasting a week.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being a graduate of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing two Special Examinations for the ordinary B.A. degree, or an Honours degree in one of the Triposes. The Natural Sciences Tripos is taken most frequently, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine* (*M.B.*) five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *first* includes (1) General and Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *second* is divided into three parts—viz., (1) Organic Chemistry, (2) Human Anatomy and Physiology; and (3) Pharmacology and General Pathology. The *third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic.

Candidates who have passed both parts of the third M.B. examination are admitted to the registrable degree of *Bachelor of Surgery* (*B.Chir.*) without separate examination and without keeping an Act.

The degree of *Doctor of Medicine* (*M.D.*) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five years, and if an M.A., to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis sustained in the Public Schools with *vivâ voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

For the degree of *Master of Surgery* (*M.Chir.*) the candidate must have passed all the examinations for B.Chir., or, if he is an M.A., have obtained some other registrable qualification in surgery. He is required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. Before he can be admitted to the examination two years at least must have elapsed from the time when he completed all required for the degree of B.Chir.

Diplomas are granted in Public Health, in Hygiene, in Tropical Medicine, in Medical Radiology and Electrology, and in Psychological Medicine. Candidates must hold a recognised medical qualification.

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An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon sending a stamped directed envelope to the Registrary, The Registry, Cambridge.

Diploma in Medical Radiology and Electrology.—This Diploma is granted by the University of Cambridge. The primary object is to provide adequate training in a branch of medical work which is becoming increasingly important and difficult, and which is outside the ordinary medical curriculum. The Diploma is only open to those who hold a medical qualification, and includes a course of lectures and practical work in physics (Part I.), and in Radiology and Electrology (Part II.). Attendances at the necessary course of lectures in both subjects and in addition six months' clinical experience in an adequately equipped hospital recognised by the Committee is essential. The whole course of study takes six months, the lectures, practical work, and hospital attendance running concurrently. The Courses carried out by the University of Cambridge are at present arranged to begin early in January. Three months are spent in Cambridge doing the lectures and practical work in Part I., attending the systematic lectures in Part II., and the practice of Addenbrooke's Hospital, where there is a fully equipped and up-to-date X ray and Electrological Department. The remaining three months can be completed at any recognised hospital, but special arrangements are made for students to continue their studies in London, where demonstrations at various hospitals are arranged in order to give a wide experience. In addition, an independent course is arranged by the British Association of Radiology and Physio-Therapy. This Course is held entirely in London, but is recognised by the University as qualifying for the examination, and begins early in

October. Further particulars as to the Cambridge Course can be obtained from Dr. F. Shillington Scales, Medical Schools, Cambridge, and of the London Courses from Dr. Stanley Melville, at the Offices of the B.A.R.P., 12, Stratford Place, London, W. 1.

ADDENBROOKE'S HOSPITAL.—Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London was established by Royal Charter in 1836 as an examining and degree conferring body with affiliated colleges but no direct teaching functions. In 1900 it was reconstituted under the Act of Parliament, 1898, and became a teaching as well as an examining body. Many schools already existing became constituent colleges, including all the metropolitan medical schools. Lecturers were also appointed in special subjects.

Teaching Staff.—The teaching staff of the University is organised under two heads: 1. Appointed teachers —i.e., such as are appointed by the University. 2. Recognised teachers—i.e., those who have been appointed and are paid by the several schools of the University and other institutions at which instruction is given under the auspices of the University, and who have been recognised by the Senate as conducting work of University standard. Courses by non-recognised teachers may also be approved in schools of the University. The lecturers in the Medical Sciences and the professors in the Faculties of Medicine in University College, London, and King's College, London, will be found enumerated under their respective schools.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (*a*) under the direct control of the University or a committee appointed thereby: or (*b*) under one or more of the appointed or recognised teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. Internal students must pursue their studies at one of the above centres, or at one of the medical schools connected with the University. These are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. The London School of Tropical Medicine and the Lister Institute of Preventive Medicine are also recognised as schools of the University in special departments. External students are all other matriculated students, and may pursue their studies at other approved universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.—The Faculty of Medicine grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*): the two higher degrees being open only to candidates holding the M.B., B.S. degrees of the University.

The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University, to be obtained from the Principal Officer, University of London, South Kensington, S.W. 7.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) *Attended* prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry; Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools.

The First Examination for Medical Degrees (Inorganic Chemistry, Physics, including Mechanics, and General Biology) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Tuesday following the third Monday in March and on the second Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the fourth Monday in October and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in Hospital; (14) The conduct of at least 20 Labours; (15) Ante-natal Clinic; (16) Experience as a Clinical Clerk in Gynæcological Work; (17) General

UNIVERSITY OF OXFORD: RADCLIFFE INFIRMARY AND COUNTY HOSPITAL.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. The hospital contains 210 beds. In connexion with the hospital there is usually held in each year during October a post-graduate course, lasting a week.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being a graduate of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing two Special Examinations for the ordinary B.A. degree, or an Honours degree in one of the Triposes. The Natural Sciences Tripos is taken most frequently, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine* (*M.B.*) five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *first* includes (1) General Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *second* is divided into three parts—viz., (1) Organic Chemistry, (2) Human Anatomy and Physiology; and (3) Pharmacology and General Pathology. The *third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic.

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The Second Examination for Medical Degrees (Part I.): Organic Chemistry.—This examination will take place twice in each year, commencing on the Tuesday following the third Monday in March and on the second Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (Part II.) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the fourth Monday in October and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology: (13) Lying-in Hospital; (14) The conduct of at least 20 Labours (15) Ante-natal Clinic; (16) Experience as Clinical Clerk in Gynæcological Work; (17) Gen-

Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year and commences on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology and Rhinology. A thesis may be submitted as for M.D.

Fees.—Matriculation £2 12*s.* 6*d.* for each entry. at provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6*s.* for each entry to the entire examination. For re-examination in one subject the fee is £2 2*s.* Second examination, Part I. £3 3*s.*, repeated on each subsequent entry; Part II. £9 9*s.* for the whole examination. Third examination: £12 12*s.* for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10*s.* M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 for convalescent patients at Swanley. It receives over 9000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day, except Saturdays, at 1.30 P.M., and Surgical consultations are held on Thursdays at the same hour. Medical consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical lectures on all special subjects are also given. Wholetime Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board, and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

New Buildings.—The new buildings comprise residential quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the Medical College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, pathological histology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions. Facilities for research work are afforded in the Clinical Units and the Laboratories of the pathological and other departments. *A Vacation Post-graduate Course*, adapted to the needs of general practitioners, is given annually. The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships in Science of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (*c*) and (*d*) are awarded after examination in Latin, Mathematics, and Greek or French or German; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology: (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, 10 guineas, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; (*p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; (*r*) Lawrence Research Scholarship and Gold Medal in Pathology, awarded by election, £115; and (*s*) Baly Scholarship in Clinical Medicine, £75, awarded by examination.

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[1] For Ancillary Metropolitan Medical Schools see p. 435.

Information may be obtained on application to the Dean to the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. Over 3000 cases pass through its wards each year, and some 24,000 out-patients and casualties are treated. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Examination and Treatment.

Appointments.—In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Medical, Surgical, and Obstetric Registrars to the Hospital are appointed annually. Six House Physicians, six House Surgeons, and two Resident Obstetric Officers are appointed each year after competitive examination.

Primary and Intermediate Studies.—By an agreement with the University of London the School sends its Primary and Intermediate Students to receive their lectures and practical work at King's College, which is situated within four minutes' walk.

Final Studies.—These are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica, Toxicology, and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped Laboratories has been established in the School. Students receive their training in Preventive Medicine, Pathology, and Bacteriology here, and are encouraged to undertake Research. Special facilities are available for Postgraduate Research and Study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital adjoining. Special lectures and demonstrations are arranged for Postgraduates.

The *Museum* contains over 4000 specimens, including a notable collection of over 800 gynæcological specimens, "The Cuthbert Lockyer Collection."

Students' Club.—The social comfort and convenience of students are met by library, reading, and smoking-rooms, refreshment-room, &c. The Club, which is under the control of a Committee of Students, provides needful athletic recreation, and includes the Medical Society. An athletic ground, comprising six acres, has recently been acquired and is now in use.

Women Students.—Women students are admitted to the School and Hospital upon the same terms and conditions as men, and after qualification are eligible for resident Hospital appointments.

Fees.—Entrance: Primary and Intermediate, 10 guineas; Final, 8 guineas; Annual, £42.

Further information may be obtained on application to the Dean, Dr. W. J. Fenton, Medical School, Charing Cross Hospital, London, W.C.

ST. GEORGE'S HOSPITAL.—This hospital has a service of 430 beds, of which 180 are allotted to surgical, 150 to medical cases, and 100 are at the Convalescent Hospital at Wimbledon. One ward is set apart for Diseases Peculiar to Women, and a Maternity Ward of 11 beds has been instituted recently. Children's beds are placed in the women's wards. Two wards are allotted to ophthalmic cases.

Entrance Scholarships and Endowed Prizes of a total value of £700 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Eight house physicians and eight house surgeons are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Registrarship at £200 per annum; Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the posts (2) of Junior Anæsthetists, each at £30. The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises, and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, cricket, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Scholarships and Prizes.—At this school three entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two University Entrance Scholarships, 90 guineas and £70 respectively; (*c*) Devitt-Pendlebury Scholarship, £50, Anatomy and Physiology. This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to eight in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*d*) William Brown Exhibition, tenable for two years and open to perpetual pupils having registrable qualifications, £150 per annum, Practice of Medicine, Midwifery, and Surgery; (*e*) William Brown Exhibition, tenable for three years and open to perpetual pupils qualified not more than three years previously, £49 per annum, Essay and Original Work; (*f*) Allingham Scholarship in Surgery for Students qualified not more than three years, £85; (*g*) and (*h*) two Brackenbury Prizes, *one* in Medicine *and one* in Surgery, £33 each. open to students of not more than five years' standing; (*i*) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (*j*) Pollock Prize, £23, Physiology. Physiological Chemistry, and Histology; (*k*) Clarke Prize, £5; (*l*) Thompson Medal, £9, Clinical Reports; (*m*) Brodie Prize, £8, Clinical Reports; (*n*) Webb Prize, open to perpetual pupils, £34, Bacteriology; (*o*) Sir Francis Laking Memorial Prize, £65, open to students having registrable qualifications.

Further information may be obtained from the Dean of the Medical School, Dr. J. A. Torrens.

GUY'S HOSPITAL.—This hospital, founded by Thomas Guy in 1724 for the reception of 400 patients, and enlarged through the aid of a large bequest from the late William Hunt, contains at the present time 626 beds. The whole of the *medical school* has been rebuilt during the last 27 years. It provides ample accommodation, with modern equipment, for all the non-clinical subjects of the medical curriculum. Within the grounds of the hospital are situated the residential college, with accommodation for 35 students. the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 20 minutes from the hospital.

House physicians, house surgeons, out-patien officers and assistant house surgeons, obstetri residents, house surgeons in the departments o

Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year and commences on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology and Rhinology. A thesis may be submitted as for M.D.

Fees.—Matriculation £2 12*s.* 6*d.* for each entry. at provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6*s.* for each entry to the entire examination. For re-examination in one subject the fee is £2 2*s.* Second examination, Part I. £3 3*s.*, repeated on each subsequent entry; Part II. £9 9*s.* for the whole examination. Third examination: £12 12*s.* for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10*s.* M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer, University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 for convalescent patients at Swanley. It receives over 9000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day, except Saturdays, at 1.30 P.M., and Surgical consultations are held on Thursdays at the same hour. Medical consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical lectures on all special subjects are also given. Wholetime Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board, and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

New Buildings.—The new buildings comprise residential quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the Medical College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, pathological histology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, laboratories for chemistry, biology, and public health, as well as a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. A new block in Giltspur-street has recently been acquired and has been fitted up as lecture theatres and laboratories for physics, chemical physiology, experimental physiology, histology, and pharmacology.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions. Facilities for research work are afforded in the Clinical Units and the Laboratories of the pathological and other departments. *A Vacation Post-graduate Course,* adapted to the needs of general practitioners, is given annually. The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships in Science of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (*c*) and (*d*) are awarded after examination in Latin, Mathematics, and Greek or French or German; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*g*) No. 2, (*f*) No. 1, £30, Anatomy and Physiology; (*h*) No. 3, £25, £20, Anatomy and Physiology; (*i*) No. 4, £15, Chemistry, Physics, and Biology; (*j*) Senior Scholar- Chemistry, Physics, and Biology:

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[1] For Ancillary Metropolitan Medical Schools see p. 435.

ment. Arrangements have been made for the use of this section, together with additional rooms for Dental Metallurgy, by the Dental School, which was opened in November last under the direction of Mr. A. Livingston, M.B., Ch.B., Mast. Dent. Surg. A full course is given in coöperation with King's College, and includes arrangements for students who desire to avail themselves of the special provisions of the Dentists Act.

Athletics.—The King's College Hospital Clubs and Societies Union was formed in 1908, and consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. An athletic ground, over six acres in extent, has been provided for the use of the students on Dog Kennel Hill, about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of "The Platanes"—a hall of residence available for students belonging to the hospital.

Fees.—The composition fee for Hospital work and Final Medical subjects of the curriculum is 93 guineas if paid in one sum, or 95 guineas if paid in two instalments, in addition to the Entrance Fee of 10 guineas. The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, *Dean;* Mr. S. C. Ranner, *Secretary of the Medical School*, King's College Hospital, Denmark Hill, S.E. 5.

London Hospital.—The hospital, with its Medical College and Dental School, is situated in the Mile End-road, E. The hospital contains 948 beds, which are in constant use, and is the only general hospital for East London. During last year 17,977 in-patients and 119,749 out-patients received treatment, while 7543 major operations were performed. 39,092 out-patients attended the special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, &c., and the Pediatric, Orthopædic, Venereal, Radiological, Electro- and Physico-Therapeutical and Inoculation Departments. The hospital presents, therefore, a large field for clinical instruction, and in its Wards and Out-patient Departments exceptional opportunities are afforded for acquiring an extensive and practical experience in all phases of disease.

A Clinical Unit in Medicine, under the charge of a whole-time director, provides for the more elaborate methods of diagnosis and treatment, and takes a leading part in the initiation and coördination of medical research.

To each medical and surgical firm throughout the hospital there is attached a First Assistant, who is responsible for instructing the clerks or dressers of the firm in elementary medicine and surgery, and who assists the honorary members of the firm in the preparation of their demonstrations. Special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research are provided under the supervision of the staff.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, for the Fellowship of the Royal College of Surgeons, for the Membership of the Royal College of Physicians, and for other higher examinations. Special entries for medical and surgical practice can be made. A residential Hostel on hospital grounds is provided for the convenience of students. The Clubs Union Athletic Ground of over 13 acres is within easy reach of the hospital.

Scholarships and Prizes.—The following is a list of the Scholarships and Prizes:—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarship, open to students of Oxford and Cambridge Universities, £75, Human Anatomy and Physiology; Buxton Prize, £10, subjects of Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), £25, Chemistry and Chemical Pathology; eight Dressers' Prizes, amounting to £40, zeal, efficiency, and knowledge of Elementary Clinical and Minor Surgery; Hutchinson Prize, triennial, £60, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 respectively; Andrew Clark Prize, biennial, £26, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Diseases of Children; and Liddle Prize, triennial, £120.

Medical Research Funds.—Research Funds of over £26,000, including the Eliza Ann Alston Endowment Fund for Medical Research, provide valuable scholarships for men wishing to undertake research or desirous of preparing Theses for University degrees.

Dean: Professor William Wright, London Hospital Medical College, E. 1.

St. Mary's Hospital Medical School.—The Hospital and Medical School are situated close to Paddington station (G.W.R.) having on one side a poor district of 500,000 persons, and on the other side the residential district of Kensington and Bayswater. The hospital contains 305 beds and, by a scheme of affiliation, for teaching purposes, of certain neighbouring hospitals, the teaching facilities extend over 1000 beds. The Athletic ground (10 acres) is situated at Wembley and can be reached in 20 minutes by a constant service of trains. A large pavilion has recently been added.

Clinical Facilities.—Clinical Units in Medicine and Surgery were established in 1920, and have now been formally recognised by the University Grants Committee, St. Mary's being one of the six Medical Schools in London which enjoy this privilege. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Institute of Pathology and Research.—Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright, F.R.S.

Appointments.—Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and preparation is being made to open 13 research beds. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually.

Complete Curriculum.—The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Entrance Scholarships.—Three Entrance Scholarships of the value of £210 each are awarded annually. Two University Scholarships of £200 each are awarded annually.

Fees.—Composition Fee for entire curriculum (5½ years) £200 in one sum, or £210 by four annual instalments. Composition Fee for Clinical curriculum (2½ years) 90 guineas in one sum, or 95 guineas by two annual instalments. As an alternative, students may pay an annual fee of 40 guineas with an entrance fee of 10 guineas.

Middlesex Hospital.—The hospital contains over 450 beds, with special wards for Cancer, Maternity and Gynæcological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and ophthalmology and genito-urinary diseases, house physician, department for diseases of children, clinical assistants, clerks to anæsthetists, surgeons' dressers, medical clinical clerks, post-mortem clerks, extern obstetric dressers, and dressers and clerks in the special departments are appointed from among the students upon the recommendation of the Medical Council according to merit. There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

The following special departments are attached to the hospital: Departments of ophthalmology, laryngology, gynæcology, diseases of children, diseases of the nervous system, dermatology, otology, actino-therapeutics, anæsthetics, dentistry, orthopædics, vaccine, tuberculosis, genito-urinary and venereal diseases, Salomon's Welfare Centre (for Maternity and Children).

Scholarships. — Six entrance scholarships are awarded annually as follows:—(*a*) one War Memorial scholarship, providing a free Medical Education for five years of the value of £200, to be awarded alternately in Arts and Science (next award, July, 1924); (*b*) one Arts scholarship of £100 for students under 21 years of age, Latin, English, Greek, or French or German, Arithmetic, Euclid, and Algebra; (*c*) one Science scholarship for students under 21 years, £100; subjects, any two of the following: Inorganic Chemistry, Physics, and Biology; (*d*) a Junior Science scholarship of the value of £100 is offered for competition, annually in July, to candidates who have attended Preliminary Science Classes at this School; (*e*) two open Science scholarships: (1) a War Memorial scholarship of the value of £80, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students under 25 years of age who have completed the curriculum for, or passed the examination in, Anatomy and Physiology for a medical degree in any University of the British Empire, and have not entered as students in any Metropolitan Medical School; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry, Pharmacology, General Pathology.

In agreement with the practice of the Universities, an allowance will be made (1) for Military Service performed by candidates, the term "military service" meaning service in the Naval or Military Forces of His Majesty or of His Majesty's Allies during the war; or (2) in respect of other approved duties in connexion with national defence.

The Dean of the Medical School is Professor T. B. Johnston, from whom further information may be obtained.

UNIVERSITY OF LONDON: KING'S COLLEGE.—The medical department (Faculty of Medical Science) at this College only deals with Preliminary and Intermediate subjects, and instruction in these subjects is given in the College laboratories by university professors and their assistants to students entering the College directly and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The department is open to both men and women.

Scholarships.—(*a*) Two Warneford Entrance Scholarships of £30 each for four years. Examination in July, subjects selected from Divinity, Classics, Science. (*b*) Sambrooke Scholarship of £30 for three years. Examination in April or May, subjects selected from Classics, Science. (*c*) Worsley Scholarships: £100 in five annual instalments of £20. (*d*) Rabbeth Scholarship of £20 for best work in first year. (*e*) Second Year Scholarship of £20 tenable for one year. (*f*) Daniell Scholarship of £40 for one year. Awarded on results of University Honours Examination.

Fees.—Tuition fee of 35 guineas for the first year, £42 per annum for the second and third years, with a materials fee of 4 guineas in the first year, 6 guineas in the second year, 4 guineas in the third year. For prospectus and further information application should be made to the Dean of the Medical Faculty (Professor E. Barclay-Smith), King's College, Strand, W.C. 2.

Dental Course.—The College, in association with King's College Hospital, has instituted courses for the Degree in Dental Surgery of the University of London and for the Dental Diploma of the Conjoint Board.

Fees.—First year (Chemistry and Physics), 20 guineas; second and third years (Anatomy, Physiology, Dental Mechanics, and Dental Metallurgy), 52 guineas per annum. Fourth and fifth years (Hospital), 60 guineas per annum. For prospectus and further information application should be made to the Secretary, King's College Hospital Medical School, Denmark Hill, S.E.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—The advanced subjects in the curriculum are taught at the Medical School attached to King's College Hospital, which is situated at Denmark Hill, S.E. 5. The hospital stands in the midst of a South London population, from which an immense amount of clinical material is forthcoming. During the past year there were 208,955 attendances in the out-patient and casualty departments. Accommodation for 400 beds for in-patients has been built, and provision will ultimately be made for 600 beds. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physicotherapy, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry. The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers, house physicians and house surgeons; resident anæsthetist; resident radiologist; bacteriologist; clinical pathologist; pathological registrar; and medical, surgical, and obstetric registrarships. Fifteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Prizes.—(*a*) Warneford Scholarships, (*b*) Sambrooke Scholarship, (*c*) Rabbeth Scholarship, £20 (see above); (*d*) Medical Entrance Scholarships, £50 (Anatomy and Physiology), and £50 (Pathology and Pharmacology) open to students who (1) propose to take a degree at any British University, and have passed their University examination in Biology, Chemistry, and Physics, and who (2) will become students at King's College Hospital from date of entering upon Scholarship; (*e*) A Medical Entrance Scholarship in Science, value £50, tenable for five years, successful candidates to study at King's College and King's College Hospital; (*f*) Three Medical Scholarships, £40 for fifth-year students, £20 for third-year students, and £20 for second-year students; (*g*) Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital; (*h*) Carter Prize, £15, Botany; (*i*) Tanner Prize, £10, Obstetrics and Diseases of Women; (*j*) Todd Prize, £4 4*s.* and medal, Clinical Medicine; (*k*) Two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the nomination of the Regius Professors; (*l*) an Epsom College Scholarship, value £50, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London. The Warneford and Sambrooke Scholars are required to take the subjects of the preliminary and Intermediate examinations at King's College, and the final subjects at King's College Hospital.

Dental School.—When the Hospital was built accommodation was provided for a Dental Depart- accommodation was provided for a Dental Depart-

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following subjects: Anatomy, Physiology, and Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (*d*) Cheselden Medal, Surgery and Anatomy; (*e*) Mead Medal, Medicine, Pathology, and Hygiene; (*f*) Toller Prize, Medicine, Pathology, and Hygiene; (*g*) Bristowe Medal, Pathology, and Morbid Anatomy; (*h*) Solly Medal and Prize, biennially, Surgical Reports; (*i*) Clutton Memorial Medal in Clinical Surgery, biennial; (*j*) Wainwright Prize, Medicine, Pathology, and Hygiene; (*k*) Hadden Prize, Pathology; (*l*) Beaney Scholarship, £50 biennially, Surgery and Surgical Pathology; (*m*) Sutton Sams Prize, biennially, reports of cases in Obstetric Medicine; (*n*) Grainger Testimonial Prize, £31 10*s*., Anatomy and Physiology; (*o*) Louis Jenner Research Scholarship, tenable for two years, £60 annually, Pathology.

The Dean of the Medical School is Sir Cuthbert S. Wallace, and the Medical Secretary Dr. A. Elliot, from whom any further information may be obtained.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—University College has been constituted a University centre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments of Physics. Chemistry, Botany, and Zoology (the Preliminary Medical Sciences; also the Departments of Anatomy, Histology, Physiology, Biochemistry, and Pharmacology (the Intermediate Medical Sciences), and the Department of Hygiene and Public Health. Research work is undertaken in all departments. The completion of the Institute of Medical Sciences, which the generosity of the Rockefeller Foundation made possible, provides exceptional facilities for research and post-graduate study in anatomy, physiology, and pharmacology. In particular might be specified the opportunities for investigation in human and comparative embryology and neurology, in histology, radiology, anthropology, biochemistry, and experimental physiology and experimental embryology. Arrangements have also been made for the closer correlation of work in the Institute with that of University College Hospital and its Medical School.

Faculty of Medical Sciences.—Composition Fees.—For the courses required by the University of London. 1. For the First Medical Course, 35 guineas, entitling to one attendance and to the privileges of the Union Society for one session. 2. For the Second Medical (Intermediate) Course 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance at Anatomy and Physiology during three years and to one attendance at Organic and Applied Chemistry, and Pharmacology, and to the privileges of the Union Society or the Women's Union Society for two sessions.

For the medical education required by the Examining Board in England: (i) For the course for the Premedical Examination, 35 guineas, entitling to attendance and to the privileges of the Union Society for one session. (ii) For the course for the First Examination, 80 guineas, payable in two instalments of 40 guineas each. This fee entitles to attendance during three years (including one attendance at each Practical Course in Physiology) in all subjects except Practical Pharmacy. It also entitles to the privileges of the Union Society for two sessions.

Scholarships and Prizes.—The first three items on the present list require a complete intermediate course at University College. The money value and subjects at examinations are as follows: (*a*) The Bucknill Scholarship, 135 guineas; (*b*) and (*c*) two Entrance Exhibitions, 55 guineas each, Chemistry, Physics, Botany, and Zoology; (*d*) Cluff Memorial Prize, £15 biennially, Anatomy, Physiology, and Chemistry; (*e*) Schafer Prize in Physiology, £18 triennially; (*f*) Sharpey Physiological Scholarship, £105, Biological Sciences; (*g*) Morris Bursary for sons of deceased professional men, by nomination, tenable for two years, £16 a year; and (*h*) five Gold and five Silver Medals awarded annually in various departments.

Women students are admitted.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—Dean: Sir George Blacker. Vice-Dean: Mr. Gwynne Williams. Secretary: Mr. G. E. Adams. Open to men and a limited number of women students. Fees for Preliminary and Intermediate Course: See under University College. For the Final M.B., B.S. (London) Course, 112 guineas if paid in one sum, 115 guineas if paid in two instalments, as follows—first year, 70 guineas; second year, 45 guineas. This fee entitles to attendance on lectures and hospital Practice during three years and to one attendance on Practical Pathology and Practical Surgery. Vaccination and attendance at a Fever Hospital are not included. This course of instruction is also suitable for the corresponding examinations at the Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. There are over 300 beds in the hospital.

Clinical Units in Medicine and Surgery are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Out-patient Department of the hospital. A Unit in Obstetric Medicine will be established as soon as the new Obstetric Hospital now in course of construction is finished.

The new buildings of the Obstetric Hospital of 60 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for 30 residents and students), the extension to the Nurses' Home, and the new research laboratories for the Medical School, are well under way, and these buildings should be ready for occupation by the spring of 1925.

Special Departments, Clinical and Laboratory Facilities.—Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments tenable by Students.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Twelve house physicians, eight house surgeons, four senior and four junior obstetric assistants (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. The house physicians and house surgeons reside free in the hospital for six months, and the senior obstetric assistants for three months. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital: Resident Medical Officer, Surgical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Casualty

Throat, and Skin; Nervous diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electro-Therapeutic department. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electro-Therapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

The Medical School, which now includes the Bland-Sutton Institute of Pathology and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly, commencing in April and October. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 29 recognised Teachers, 8 Demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology is completely equipped for routine hospital investigations, teaching and research work, and contains a new lecture theatre and large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility for study.

Other features of interest are: the institution of a course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone. Primary F.R.C.S. class will resume in July.

Special classes are held to prepare students for the Intermediate Examinations of the Universities.

Hospital Appointments.—All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one resident anæsthetist, and two resident officers to the special departments. The medical and surgical casualty officers are appointed twice a year. Eight registrars are appointed annually. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department.

Scholarships, Prizes, &c.—(*a*), (*b*). Two Entrance Scholarships, value £100 each, and (*c*) a University Scholarship, value £50, are awarded annually in September. The successful candidates are required to become general students of the school. (*d*) A Freer Lucas Scholarship for Foundationers or Council Exhibitioners of Epsom College is awarded annually on the nomination of the Headmaster. There are also, (*e*) and (*f*), two Broderip Scholarships, value £60 and £40 respectively; (*g*) the Lyell Gold Medal and Scholarship, value £55 5*s.*; (*h*) the John Murray Medal and Scholarship, value £25 (awarded every third year); (*i*) the Freeman Scholarship, value £30; (*k*) the Hetley Clinical Prize, value £25; (*l*) the Leopold Hudson Prize, value 11 guineas; and (*m*) the Second Year's Exhibition, value 10 guineas. There are also numerous class prize examinations.

Fees.—The fees are arranged on a basis of an annual payment of approximately £42 for the six years of the curriculum. After six years, if the student is not qualified, the annual fee is £21.

The Amalgamated Students' Club includes the following: the Medical Society, the Common Room Society, Musical Society, the cricket club, the football clubs, the athletic club, the rowing club, the musical society, the chess club, the lawn tennis club, and the hockey club. There are a restaurant and gymnasium in the school buildings, and large athletic grounds at Wembley, with new pavilion. A subscription to the Amalgamated Students' Club is payable by all General and Dental students. Full particulars on application to the Dean, Middlesex Hospital Medical School, W. 1.

St. Thomas's Hospital.—This Hospital received its present charter from King Edward VI., but as a monastic institution was in existence prior to the year 1207. The building occupies a unique position by the river, opposite the Houses of Parliament, and contains 644 beds. The in-patients last year numbered 9930, whilst the number of attendances as out-patients, including the casualty and light departments, was 462,287. There are special departments for the treatment of women, children, the eye, ear, nose and throat, skin, teeth, and for orthopædics. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for light treatment, X rays, and the Physico-therapeutics are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. All appointments in the hospital are open to students without extra fee. Appointments open to students before qualification: Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists. The Students' Club comprises a spacious restaurant and smoking and reading room. There is no occasion for students to leave the hospital buildings during working hours. The curriculum is arranged to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments Open to Students after Qualification.—A Resident Assistant Physician, a Resident Assistant Surgeon, and a Resident Anæsthetist are appointed annually at a salary of £200 each per annum. Two Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. An Obstetric Tutor and Registrar, an Ophthalmic Registrar (at an annual salary of £50 each), and an Orthopædic Registrar (unpaid) are appointed yearly. Two Senior Resident Casualty Officers (Medical and Surgical) are appointed yearly. Eight Resident Casualty Officers and Anæsthetists are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Fees.—The annual fees are: For each year of study £50. These fees cover all tutorial classes, but do not include instruction in infectious fevers, pharmacy, and vaccination. Qualified practitioners are permitted to attend the hospital practice on terms which may be ascertained from the Medical Secretary.

clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 16, Brunswick-square, 5, Mecklenburgh-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students. The Students' Union arranges the social, athletic, and other clubs and societies.

Scholarships and Prizes.—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years and next to be awarded in 1925. (*d*) Bostock Scholarship, tenable for two or four years, and next to be awarded in June, 1927, £90. (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1926, £14 10*s*. (*i*) John Byron Bursary, tenable for two years, for students already in the School requiring assistance for the prosecution of their medical studies, application to the Secretary by March 31st, £20. (*k*) Helen Prideaux Prize, awarded every second year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £40. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (*m*) Sarah Holborn Scholarship, value £20 a year for three or five years, awarded every alternate year; next award in 1925. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s*. a year, awarded in alternate years; next award in July, 1925. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1928. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2*s*. and £1 1*s*. are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5*s*., is awarded yearly. The Edith Pechey Phipson Prize in Pharmacology, value £3 3*s*., is awarded annually.

The Dean of the Medical School is Miss Aldrich-Blake, M.D., M.S.; the Honorary Secretary, Dr. May Thorne; and the Warden and Secretary, Miss L. M. Brooks, to whom inquiries may be addressed.

UNIVERSITY OF DURHAM.

To return to the curriculums of the Universities, there are six English provincial universities providing a full course for the medical student.

Two Diplomas, one Licence, and nine degrees are conferred—viz., the Diploma in Public Health, Diploma in Psychiatry, the Licence in Dental Surgery, and the degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, Doctor of Hygiene, Bachelor of Dental Surgery, and Master of Dental Surgery.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Biology and Organic Chemistry. The subjects of the Second Examination are—Anatomy and Physiology. The subjects for the Third Examination are—Materia Medica and Pharmacy, Pharmacology, Medical Jurisprudence, Public Health, and Pathology and Elementary Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine, Surgery and Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Therapeutics, Psychological Medicine, and Diseases of the Skin, of the Throat, Nose, and Ear, and of Children, and Ophthalmology. It is required that at least one of the five years of professional education shall be spent in attendance at the University College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the Theory and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates shall not be under 40 years of age and shall have been in active practice for 15 years as registered medical practitioners. They shall produce certificates of moral character from three registered members of the medical profession. The fee will be 50 guineas, of which 20 guineas will be retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 24 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad. The fee for the examination is £20, and the fee for the degree is £10.

Candidates for any of the above degrees, diplomas, or licence, must give at least 28 days' notice to Professor Howden, Registrar, College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before the 1st of April.

Scholarships and Prizes.—In connexion with this University the following Scholarships and prizes are awarded:—University of Durham Entrance Scholarship, £25 a year for four years; Pears' Entrance Scholarship, £10 a year for three years (awarded every third year); Province of Durham Masonic (Entrance) Scholarship, £30; Heath Scholarship for Surgery, £200, available every second year.

The following Scholarships are tenable for one year, namely:—Tulloch Scholarship for Elementary Biology

Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Ophthalmic, Skin and Venereal Diseases Departments, and House Anæsthetist.

Museum of Pathological Anatomy.—The Museum is open for study from 9 A.M. to 5 P.M. Microscopic sections of most of the specimens in the Museum have been prepared and are available for the use of students on application to the Curator. The Museum contains 1100 admirable paintings by Sir Robert Carswell and Sir Charles Bell and a collection of old surgical instruments formerly belonging to Robert Liston.

The Anatomical Museum of the University of London, University College, is open to all students of University College Hospital and Medical School on the recommendation of the School Committee.

The Medical Library is open daily for the purposes of study to every student of the Medical School from 9 A.M. to 5 P.M., Saturdays 9 A.M. to 1 P.M. It contains about 13,500 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School. The Athletic Ground, which is used in conjunction with the Union Society of the University of London University College, is situated near the G.W.R. station at Perivale.

Scholarships and Prizes.—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions, 112 guineas each, Anatomy and Physiology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £100, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £60, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10*s*., Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

Residence of Students.—University College Hall, Ealing, is recognised by the Medical School authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge. Gentlemen who desire assistance in their studies should consult the Dean or Lecturers.

WESTMINSTER HOSPITAL.—The hospital contains 236 beds and affords relief to upwards of 2500 in-patients and 25,000 out-patients annually. There are separate departments for Diseases of the Eye, Skin, Teeth, Ear, Nose, and Throat, for Orthopædic practice, for Diseases of Women, for Diseases of Children, for Radiography, for Venereal Diseases, and for Massage, Electrical and Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to male and female students.

By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £70 each. Summer Session: Two Scholarships in Anatomy and Physiology, £70 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Reports on Cases; Clinical Surgery Prize, £5, Reports on Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year Students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, tenable for two years, £20, Chemistry; Rabbeth Scholarship, open to First-year Students, £20; Class Examinations in the Preliminary Scientific Course; and the Sambrooke King's College Scholarship in Science, value £25. Inquiries and requests for Prospectus may be addressed to the Dean, Dr. A. S. Woodwark.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN, 8, Hunter-street, Brunswick-square, W.C.—The fee for the medical course for the degrees of the University of London and for the diplomas of the Royal Colleges of England and for other qualifications is £240 in five instalments. This sum includes library and laboratory fees. Arrangements are made for pre-medical courses in Chemistry and Physics, which are included in these fees.

The Royal Free Hospital contains 240 beds. The Hospital also has large Casualty and Out-patient Departments, and Departments for Special Diseases. A new and specially equipped block contains the Obstetrical and Gynæcological Unit which, with the Marlborough Maternity Department, controls 68 beds. A Maternity District is attached to the Unit. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysed and Epileptic, South London Hospital, and Royal London Ophthalmic Hospital.

Courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the Royal London Dental Hospital, Leicester-square.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and to submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, Part I., £2 10s.; First Examination, Part II., £2 10s.; Second Examination, £2 10s.; Third Examination, £2 10s.; Final Examination. £10; M.D. or Ch.M., £12 10s.

At the University of Birmingham the following Scholarships are awarded:—(*a*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland (will be offered in 1925); (*b*) two Ingleby Scholarships of £10 each awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*c*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*d*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 10 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*e*) Dental Scholarship of £37 10s., Open Competitive Examination in subjects learned during apprenticeship; (*f*), (*g*), (*h*), and (*i*) Four Queen's Scholarships of £10 10s. each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (*j*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*k*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate passing the Final M.B., Ch.B. in June, who obtains the highest marks in Clinical Medicine, provided the marks so gained be not less than 60 per cent. The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in the fourth and fifth years (open to all students).

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital under the direction of the University Clinical Board. The hospitals possess more than 600 beds, treating annually about 9000 in-patients and 70,000 out-patients. The curriculum is adapted in the first place to the University of Birmingham, but it also meets the requirements of the examinations of other licensing bodies. At the General Hospital there are open to the students the following appointments: A surgical registrar, £200 per annum; a resident medical officer, elected annually (£155); a resident surgical officer, elected annually and eligible for re-election for three years (£180); a resident pathologist, elected for six months (£100); three house physicians and four house surgeons hold office for six months, receiving board, residence, and salaries at the rate of £70 a year; two house surgeons to the gynæcological, ophthalmic, and aural departments are elected every six months, receiving board, residence, and a salary of £70 a year; two assistant house surgeons are elected every three months, receiving board, residence, and salaries at the rate of £40 a year, and a resident medical assistant at this hospital, who is not necessarily qualified, is provided with board and residence, and holds office for three months. At the Queen's Hospital there are open to the student the following appointments: Three house physicians, three house surgeons, and one obstetric and ophthalmic house surgeon, who hold office for six months and have salaries at the rate of £70 a year. One casualty house surgeon who holds office for three months at salary at rate of £70 a year. Four non-resident obstetric students who hold office for one month and receive board only on payment of one guinea per week. Thirty-eight other appointments of varying value are at the City Workhouse and Workhouse Infirmary, at the Birmingham General and Branch Dispensaries, at the Birmingham Mental Hospitals, at the City Fever Hospitals, at the Children's Hospital, at the Birmingham and Midland Eye Hospital, at the Orthopædic and Spinal Hospital, at the Maternity Hospital, and at the Ear and Throat Hospital.

Post-graduate Courses.—A Lectureship in Morbid Psychology was established in 1919 in the University. and courses of lectures are given annually by specialists in the subject. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. Post-graduate Courses of Clinical Demonstrations (for General Practitioners) at the Birmingham General and Queen's Hospitals were held from April to August, 1924. Further courses will be arranged later.

Birmingham General Hospital.—370 beds are in daily use, 6000 in-patients per annum. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, Septic and Infectious cases; special beds for Eye and Skin cases. About 50,000 out-patients per annum. Laboratories for Bacteriology and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electro-therapy, Extern Midwifery, and Venereal Diseases. Post-graduate classes are held in every branch of medicine and surgery. The Jaffray Branch Hospital contains 56 beds.

Queen's Hospital (Beds 224).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, dentistry, radiography, pathology, bacteriology, massage, electricity, whirlpool baths, electro-cardiograph, &c.

Birmingham and Midland Eye Hospital, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of over 250. Students attending for a period and Organic Chemistry, £20; Dickinson Scholarship for Medicine, Surgery, Midwifery, and Pathology; Gold Medal and £20; Charlton Scholarship for Medicine, £25; Gibb Scholarship for Pathology, £28; Luke Armstrong Scholarship for Comparative Pathology, £25; Stephen Scott Scholarship for Surgery, £40; Philipson Scholarships for highest marks in Final M.B., B.S. Examinations, two of £48 each; Goyder Memorial Scholarship for Clinical Medicine and Clinical Surgery, interest on £325; Gibson Prize for Midwifery and Diseases of Women and Children, £10; Turnbull Prize and Silver Medal for Surface Anatomy; and Outterson Wood Prize for psychological Medicine, £10. At the end of each session a Prize of Books is awarded in each of the regular classes. For further information apply to Professor R. Howden, Registrar of the College.

The College of Medicine, Newcastle-upon-Tyne.—Clinical instruction is given at the Royal Victoria Infirmary, containing about 550 beds. In it adequate accommodation is provided for the study of the various special subjects, in addition to the ordinary clinical work. Post-graduate classes are held.

The Bacteriological Laboratory.—A new Bacteriological Laboratory has recently been erected adjacent to Armstrong College.

The Princess Mary Maternity Hospital.—The new Maternity Hospital, containing 65 beds, was opened by H.R.H. Princess Mary Viscountess Lascelles in November last. The hospital is thoroughly up to date, excellently equipped, and there is an annual indoor and outdoor attendance on 3000 cases.

Students' Union.—Students' Union Buildings are being erected at a cost of about £40,000 and will be opened early in 1925. Separate accommodation (non-residential) is provided for men and women students.

Newcastle-upon-Tyne Royal Victoria Infirmary.—The Infirmary was founded in 1751, but has been entirely rebuilt, the new hospital being opened by His late Majesty King Edward VII. in 1906. The number of beds is 550. The number of in-patients annually is 12,000 and out-patients' attendances 297,000. The medical students of the University of Durham attend the practice of this hospital. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by the Assistant Physicians and Assistant Surgeons, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory, in which all clinical bacteriological investigations are carried out—opsonic indices estimated with a view to treatment by vaccines and serums, &c. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1924 opens on Oct. 1st and the summer session of 1925 on April 14th. Applications for detailed information should be made to the Dean, Dr. Horsley Drummond, at the hospital.

There are other institutions in addition to the Royal Victoria Infirmary at which the student of medicine of the University of Durham can receive clinical instruction. Practical Midwifery can be studied at the Princess Mary Maternity Hospital, Newcastle-upon-Tyne, which contains 65 beds, with an annual indoor and outdoor attendance on 3000 cases. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is further taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye.

Post-Graduate Instruction.—For the year 1924–1925 the following post-graduate courses have been arranged:—1. General courses in Clinical Medicine, Surgery, and Pathology at the Royal Victoria Infirmary, meeting once weekly for ten weeks. One course will be held from October to December and one from April to June. 2. Special courses of clinical instruction, meeting once weekly for ten weeks, in the following subjects: Gynæcology; Diseases of the Eye; Diseases of the Throat, Nose and Ear; Diseases of the Skin; Venereal Diseases; Neurology. Special courses in Midwifery will be held at the Princess Mary Maternity Hospital. 3. An intensive course of 14 days' duration in the early part of the Summer Vacation, 1925. 4. In addition to the regular post-graduate courses practitioners may attend the ordinary medical and surgical practice of the Royal Victoria Infirmary for specified periods.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Chemistry, Physics, and Elementary Biology. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof, and a recognised Pre-Medical Examination in Chemistry and Physics. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. First Examination.—Part I., Elementary Biology and Organic Chemistry.—Part II., Anatomy and Physiology. Second Examination.—General Pathology and Bacteriology, Materia Medica, and Practical Pharmacy. Third Examination (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, Therapeutics, and Special Pathology. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital one month, and mental hospital three months. Vaccination instruction must be taken out and courses of Ophthalmology, Venereal Diseases, Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery.

Degrees of Doctor of Medicine and Master of Surgery.—At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver, for the M.Ch. A thesis of exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and to submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, Part I., £2 10s.; First Examination, Part II., £2 10s.; Second Examination, £2 10s.; Third Examination, £2 10s.; Final Examination, £10; M.D. or Ch.M., £12 10s.

At the University of Birmingham the following Scholarships are awarded:—(*a*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. candidates, tenable at some University or Hospital not in Great Britain or Ireland (will be offered in 1925); (*b*) two Ingleby Scholarships of £10 each awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*c*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*d*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*e*) Dental Scholarship of £37 10s., Open Competitive Examination in subjects learned during apprenticeship; (*f*), (*g*), (*h*), and (*i*) Four Queen's Scholarships of £10 10s. each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (*j*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*k*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate passing the Final M.B., Ch.B. in June, who obtains the highest marks in Clinical Medicine, provided the marks so gained be not less than 60 per cent. The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in the fourth and fifth years (open to all students).

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital under the direction of the University Clinical Board. The hospitals possess more than 600 beds, treating annually about 9000 in-patients and 70,000 out-patients. The curriculum is adapted in the first place to the University of Birmingham, but it also meets the requirements of the examinations of other licensing bodies. At the General Hospital there are open to the students the following appointments: A surgical registrar, £200 per annum; a resident medical officer, elected annually (£155); a resident surgical officer, elected annually and eligible for re-election for three years (£180); a resident pathologist, elected for six months (£100); three house physicians and four house surgeons hold office for six months, receiving board, residence, and salaries at the rate of £70 a year; two house surgeons to the gynæcological, ophthalmic, and aural departments are elected every six months, receiving board, residence, and a salary of £70 a year; two assistant house surgeons are elected every three months, receiving board, residence, and salaries at the rate of £40 a year, and a resident medical assistant at this hospital, who is not necessarily qualified, is provided with board and residence, and holds office for three months. At the Queen's Hospital there are open to the student the following appointments: Three house physicians, three house surgeons, and one obstetric and ophthalmic house surgeon, who hold office for six months and have salaries at the rate of £70 a year. One casualty house surgeon who holds office for three months at salary at rate of £70 a year. Four non-resident obstetric students who hold office for one month and receive board only on payment of one guinea per week. Thirty-eight other appointments of varying value are at the City Workhouse and Workhouse Infirmary, at the Birmingham General and Branch Dispensaries, at the Birmingham Mental Hospitals, at the City Fever Hospitals, at the Children's Hospital, at the Birmingham and Midland Eye Hospital, at the Orthopædic and Spinal Hospital, at the Maternity Hospital, and at the Ear and Throat Hospital.

Post-graduate Courses.—A Lectureship in Morbid Psychology was established in 1919 in the University, and courses of lectures are given annually by specialists in the subject. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. Post-graduate Courses of Clinical Demonstrations (for General Practitioners) at the Birmingham General and Queen's Hospitals were held from April to August, 1924. Further courses will be arranged later.

BIRMINGHAM GENERAL HOSPITAL.—370 beds are in daily use, 6000 in-patients per annum. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, Septic and Infectious cases; special beds for Eye and Skin cases. About 50,000 out-patients per annum. Laboratories for Bacteriology and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments, which include those for Radium, Electro-therapy, Extern Midwifery, and Venereal Diseases. Post-graduate classes are held in every branch of medicine and surgery. The Jaffray Branch Hospital contains 56 beds.

QUEEN'S HOSPITAL (Beds 224).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, dentistry, radiography, pathology, bacteriology, massage, electricity, whirlpool baths, electro-cardiograph, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of over 250. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available on various subjects when a sufficient number of graduates are present. A limited number of Non-Resident Clinical Assistants posts are available to qualified practitioners, particulars of which can be had on application to the General Superintendent.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 22 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The fee is £5 for each examination. The subjects of the First Examination are: (1) Chemistry; (2) Physics; (3) Biology (Zoology and Botany). The subjects of the Second Examination are (*a*) (1) Anatomy; (2) Physiology (including Physiological Chemistry and Histology); and (*b*) (3) Elementary Bacteriology, (4) Clinical Chemistry, (5) General Pathology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (*a*) (1) Special Pathology and Morbid Anatomy; (2) Forensic Medicine and Toxicology; (3) Public Health; (4) Pharmacology and General Therapeutics; (*b*) (5) Obstetrics and Diseases of Women; (6) Surgery, Systematic, Clinical, Operative and Practical, including Ophthalmology; (7) Medicine, Systematic and Clinical, including Therapeutics, Mental Diseases, and Diseases of Children. Candidates may present themselves in Parts (*a*) and (*b*) separately, but candidates must have completed the fifth year of medical study before taking Part (*b*).

Degrees of Doctor of Medicine and Master of Surgery.—No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees, or, in the case of the degree of Doctor, unless, having obtained substantially equivalent degrees in an approved University, he has subsequently spent two years in the University or in the Clinical School in the performance of research or the conduct of systematic clinical observations. Candidates for the degree of Doctor of Medicine are required to present a thesis together with, if desired, published original work relative to medical science. An examination is required if the work submitted is not of special merit. If the work submitted is of special merit, but extremely specialised, a candidate may be asked to submit a reasoned report on a subject set by the examiners.

The University has recently established a Diploma in Medical Radiology and Electrology—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

At this University the following Scholarships and Fellowships and Prizes are awarded:—(*a*) and (*b*) Robert Gee Entrance Scholarships, two annually, of £25 each tenable for two years Joint Matriculation Board Examination held in July, open to First M.B. Course Students; (*c*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects; (*d*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination among Senior Students in Anatomy, Physiology, Pharmacology, and Materia Medica; (*e*) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (*f*) University Scholarship of £25 for one year, awarded on results of Second Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £150 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Bio-Chemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; (*p*) Lady Jones Research Fellowship in Orthopædic Surgery, £200; (*q*) Samuels Memorial Scholarships, three at £20; numerous prizes and medals.

Medical School Buildings.—Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation. All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. A new building for Tropical Medicine has recently been opened.

Clinical Instruction.—The Clinical School of the University consists of four general hospitals—the **Royal Infirmary**, the **David Lewis Northern Hospital**, the **Royal Southern Hospital**, and the **Stanley Hospital**; and of six special hospitals—the Eye and Ear Infirmary, the Hospital for Women, Liverpool Maternity Hospital and Ladies' Charity, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1445 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine is awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University subsequently to the date of passing the first M.B. Examination. All candidates for the degrees of Bachelor of Medicine and Bachelor of Surgery are required to satisfy the examiners in the several subjects of the following examinations. (These are now under revision.)

The First Examination.—(1) Chemistry and Physics; (2) Biology. Candidates must have attended during at least one year courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, Biology. The candidates sit for these parts separately.

The Second Examination.—(1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry.

The Third Examination.—(1) Pathology; (2) Pharmacology and Therapeutics.

The Final Examination.—(1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts.

Candidates for the Second Part of the Final Examination must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Scholarships, Fellowships, and Prizes.—At this University there are 22 Foundation Scholarships, 12 Exhibitions, five being for subjects connected with medical study, a Surgical Prize, a University Fellowship (Leech Fellowship, £100), Research Fellowships in Public Health, and Honorary Research Fellowships. 13 Entrance Scholarships are tenable for Medical courses; one Scholarship is offered in Surgery, Biology, Physiology, and Diseases of Children respectively, and one General Medical and Surgical. Exhibitions are offered in Physiology and Anatomy, and one for French and German. "The Dumville" Surgical Prize is awarded on the results of the Final Examination in Surgery in the Summer Term, £15. The Leech Fellowship (£100) is for the encouragement of study and research, and is open to persons who have graduated M.B., Ch.B., in the University not more than 18 months previously. The Honorary Research Fellowships, tenable for two years, conferring the right of free use of the laboratories, are awarded generally in October on application, with evidence of capacity for independent investigation.

There are many entrance scholarships, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and general and departmental libraries. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Royal Infirmary Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, a lunatic asylum, and a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Clinical Instruction.—THE MANCHESTER ROYAL INFIRMARY.—The Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 663 patients (including 54 beds at the Central Branch). The medical side consists of five units, each unit having a testing-room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing and apparatus rooms, and its own class-room attached. All of these units are occupied. In the educational block is a large lecture theatre and a museum. In the same building is housed the X ray department, which has nine separate X ray outfits for different purposes, and in which one large room is put aside specially for X ray demonstrations and teaching purposes. A large massage school is also connected with this department.

The number of patients treated during the year 1923 was 12,705 in-patients, and 49,227 out-patients; of the latter figure 9144 were treated in the accident room of the Infirmary. About 9000 operations are performed annually in the operation theatres.

Associated with the Infirmary are: (1) the Convalescent Hospital at Cheadle, containing 132 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the City, which has now accommodation for 54 patients. The Associated Hospitals thus contain 1225 beds and are under the same management. Women students are admitted on the same terms as men.

Fees.—Medical Practice: Three months, 7½ guineas; six months, 12 guineas; twelve months, 18 guineas; full period required by the Examining Bodies, 60 guineas.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

The Dean of Clinical Instruction is Dr. T. H. Oliver.

ROYAL MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and St. Anne's-on-the-Sea.—The hospital contains 190 beds and 28 in the Convalescent Home, St. Anne's-on-the-Sea. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electro-therapeutic Department. Two Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is a new Orthopædic Department. A special out-patients' day is held on Tuesday mornings at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 72 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical, including Mental Disease and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics, and Gynæcology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

These conditions are at present under review in connexion with the recommendations of the General Medical Council.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus, &c., can be obtained from the Academic Sub-Dean of the Medical School.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods may do so on terms which may be obtained from the Clinical Sub-Dean.

Clinical Instruction.—**THE LEEDS GENERAL INFIRMARY**, in connexion with this medical faculty, has accommodation for 632 in-patients, including 88 beds at branch hospitals in the country. During 1922 10,277 in-patients and 41,857 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects of the examination are Anatomy and Physiology. Candidates must have completed the second year of professional study.

The Third Examination.—The subjects of the examination are Pathology, Pharmacology, Anatomy and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study.

The Final Examination.—The subjects of the examination are:—Part I.—Forensic Medicine and Public Health; Part II.—Medicine (including Mental

Diseases and Diseases of Children). Surgery. Obstetrics (including Gynæcology). Candidates for Part I. must have completed the Michælmas Term of the fifth year of professional study: candidates for Part II. must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the degree of Doctor of Medicine must have passed the examination for the degrees of M.B., Ch.B. at least one year previously, must present a thesis embodying observations in some subject approved by the professor of medicine, and must pass an examination in the Principles and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have taken the M.B, Ch.B. at least one year previously, and must since have held for not less than six months a surgical appointment in a public hospital.

The subjects of examination are Systematic, Clinical, and Operative Surgery, Surgical Anatomy Surgical Pathology, and Bacteriology.

Scholarships, &c.—At this University, in addition to six Edgar Allen scholarships of £125 a year for three years, holders of which can take the courses in the Faculty of Medicine, there are 11 scholarships tenable in the Faculty of Medicine. Full particulars as to curriculum, scholarships, &c., may be had on application to the Registrar or to the Dean of the Medical Faculty.

The Medical School.—The new buildings of the University opened in 1905 are situated at the west end of the city, adjoining Weston Park, and the Medical Department occupies the entire north wing of the University quadrangle. The various athletic and other students' societies are under the management of the Union Representative Council, elected annually. There are large and comfortable common rooms both for men and women students, and two Students' Unions, one for men and one for women. A refectory is open daily at the University where students may obtain refreshments, lunch, dinner, &c., at extremely moderate prices. The University journal, *Floreamus*, edited by a committee of staff and students, is published each term. The University Halls, "Oakholme," Clarkehouse-road, and "Tapton Cliffe," Fulwood-road, are recognised by the Senate as halls of residence for women students; full particulars may be obtained of the tutor for women students.

Clinical Instruction.—The University is within easy reach of the various hospitals with which it is connected for clinical purposes. These are as follows: The ROYAL INFIRMARY (Secretary, Mr. J. W. Barnes), containing 351 beds, with an annual average number of over 5100 in-patients, over 16,000 out-patients, and over 19,000 casualties: the Royal Hospital (Sec., Mr. J. W. Robinson), with 234 beds, and an annual number of 3600 in-patients, over 30,000 out-patients, and over 16,000 casualties: and the Jessop Hospital for Diseases of Women, with 91 beds, over 1000 in-patients, and over 2300 out-patients: also a Maternity department, with about 700 in-patients per annum and about 250 out-patient cases attended. Special courses on Fevers are held at the City Fever Hospitals (600 beds) and on Mental Diseases at the South Yorkshire Asylum (1691 beds). For purposes of clinical practice the practices of the Royal Infirmary and Royal Hospital are amalgamated, giving a total of 585 beds for the treatment of medical, surgical, and special cases. There are special departments for the treatment of Diseases of the Eye at each institution, with wards assigned to them. In addition to these the Royal Infirmary has special departments for the treatment of Diseases of the Skin and Ear, with beds assigned to them, whilst at the Royal Hospital there are special out-patient departments for Diseases of the Throat, Ear, Skin, Orthopædics, and Mental Diseases. Instruction is also given at the South Yorkshire Asylum (1691 beds). The department of Pathology and Bacteriology in the University is fitted with every requirement for the most advanced work in these subjects.

Fees.—The Medical Composition Fee is £38 a year for each of the five years.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Conjoined Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, of which three shall have been passed in the University, and two of these three subsequent to pass in the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations.

The First Examination.—The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.)

The Second Examination.—The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). Parts I. and II. may be passed separately or together.

The Final Examination.—The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). The subjects included in Part II. may be taken in two groups—viz., Group I., Surgery and Obstetrics; Group II., Medicine, Public Health, Special Pathology, Forensic Medicine, and Toxicology. Candidates may pass Parts I. and II. together, or separately, and the two groups of Part II. may likewise be taken together or separately. Forensic Medicine and Toxicology may be taken either with Part I., or with Group II. of Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynæcology.

Clinical Instruction.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL)

ROYAL MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, Gartside-street, Manchester, and St. Anne's-on-the-Sea.—The hospital contains 190 beds and 28 in the Convalescent Home, St. Anne's-on-the-Sea. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electro-therapeutic Department. Two Clinical Assistants are appointed for periods of six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is a new Orthopædic Department. A special out-patients' day is held on Tuesday mornings at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 72 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical, including Mental Disease and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics, and Gynæcology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

These conditions are at present under review in connexion with the recommendations of the General Medical Council.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus, &c., can be obtained from the Academic Sub-Dean of the Medical School.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods may do so on terms which may be obtained from the Clinical Sub-Dean.

Clinical Instruction.—**THE LEEDS GENERAL INFIRMARY**, in connexion with this medical faculty, has accommodation for 632 in-patients, including 88 beds at branch hospitals in the country. During 1922 10,277 in-patients and 41,857 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Mental Hospital and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects of the examination are Anatomy and Physiology. Candidates must have completed the second year of professional study.

The Third Examination.—The subjects of the examination are Pathology, Pharmacology, Anatomy and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study.

The Final Examination.—The subjects of the examination are:—Part I.—Forensic Medicine and Public Health; Part II.—Medicine (including Mental places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

1. *Regulations applying to all candidates who passed the required Preliminary Examination in General Education before Jan. 1st, 1923.*

Professional Examinations.—There are three Examinations, called herein the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral and partly practical. These examinations will be held in the months of January, April, July, and September or October unless otherwise appointed. Every candidate must give notice in writing to Mr. F. G. Hallett, O.B.E., Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, W.C., 14 clear days before the day of the examination, transmitting at the same time the required certificates.

The subjects of the *First Examination* are—Chemistry, Physics, and Elementary Biology. A candidate may take this examination in two parts at different times (Chemistry and Physics must be taken together until the required standard is reached in both or in one of these subjects, but a candidate will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other). A candidate will be admitted to examination in Chemistry and Physics, and in Elementary Biology on producing evidence of having passed the required Preliminary Examination and of having received instruction in these subjects at a recognised institution. A candidate rejected in one part or more of the First Examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection, and he will be re-examined in the subject or subjects in which he has been rejected. If referred in Chemistry, Physics, or Biology he must produce evidence of further instruction at a recognised institution. Any candidate who shall produce satisfactory evidence of having passed an examination for a degree in Medicine in any of the subjects of this examination conducted at a university in the United Kingdom, in India, or in a British colony will be *exempt from* examination in those subjects.

The fees for admission to the First Examination are as follows: For the whole examination, First Admission, £10 10s.; re-examination in Chemistry, £3 3s.; re-examination in Physics, £2 2s.; re-examination in Biology, £3 3s. Second Conjoint: This examination is in two parts—viz.: Part I., Anatomy and Physiology: Part II., Materia Medica and Pharmacology. A candidate must have attended at a recognised medical school, lectures on Anatomy, Physiology, and a course of Practical Physiology and Histology, and have dissected for twelve months during the ordinary sessions. He must also attend three months' lectures or demonstrations in Pharmacology and receive instruction in Practical Pharmacy. Part II. may be passed at the same time as Part I., or before or after that part, provided the conditions of admission to the whole examination

cates of study required for the respective parts, provided that the examination is not completed before the expiration of five years *from* the date of passing the Preliminary Examination.

The fees for admission to the *Third* or *Final Examination* are as follows: Third Examination: £21; re-examination in Part I., Medicine, £6 6s.; Part II., Surgery, £6 6s.; Part III., Midwifery and Diseases of Women, £4 4s. Members of English, Scotch, or Irish Universities £5 5s. for first admission to the examination and £36 15s. for the diplomas.

A candidate referred on the *Third* or *Final Examination will not be admitted to re-examination* until after the lapse of a period of not less than three months from the date of rejection and will be required, before being admitted to re-examination, to produce a certificate, in regard to Medicine and Surgery, of having attended the Medical and Surgical Practice, or the Medical or Surgical Practice, as the case may be, during the period of his reference; and in regard to Midwifery and Diseases Peculiar to Women a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognised teacher.

2. *Regulations applicable to candidates who passed the required Preliminary Examination in General Education on or after Jan. 1st, 1923.*

Students are required to pass a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board: a Pre-Medical Examination conducted by any of the Qualifying Bodies whose Degrees or Diplomas *are registrable on the Medical Register*: the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board: the Higher Certificates of London, Bristol, Durham Universities, and the Joint Matriculation Board of the Northern Universities. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education and of having received *instruction during* 180 hours in Chemistry and 120 hours in Physics to the satisfaction of his teachers. These courses may be commenced or attended before the required Preliminary Examination in General Education is passed. The examination is partly written, partly oral and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months and he must produce evidence of further instruction in the subject or subjects of failure. The fee for the examination have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye, Throat, and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well-equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High Frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

Appointments.—(1) Undergraduate: Clinical clerkships, dresserships, also ophthalmic, obstetric, pathological and ear, nose, and throat clerkships, are tenable at the Bristol Royal Infirmary and the Bristol General Hospital. In these institutions the dressers reside in rotation free of charge. (2) Post-graduate: At the Bristol Royal Infirmary: Four house surgeons, £80 each per annum; two house physicians, £80; two resident obstetric officers, one of whom is also ophthalmic house surgeon, £100 and £80: ear, nose, and throat house surgeon, £80; dental house surgeon, £80. All these appointments are made for six months. From the resident officers a senior resident officer is appointed at a salary of £200. At the Bristol General Hospital: Senior resident medical officer, £250 per annum; casualty house surgeon, £80 per annum; two house physicians, £80 per annum; house surgeon, £80 per annum; special obstetric physician, £80 per annum; house surgeon to special departments, £80 per annum; dental house surgeon, £300 per annum. All these appointments are for six months, except that of senior resident medical officer, which is for two years.

Scholarships.—The following are among the scholarships and other awards open to students of the school: The Ashworth Hallett Scholarship, value £45, open to women only; Two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value about 6 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s.*, for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14: Lady Haberfield Scholarship, value about 25 guineas: Phyllis Siepman Prize, for proficiency in Diseases of Children, value £50.

Bristol City Senior Scholarships and the Senior Scholarships offered by the counties of Gloucestershire, Somerset, Wilts, Devon, &c., are tenable in the University.

Some of the Fellowships awarded by the Colston Research Society for research in the University are allotted to the Faculty of Medicine.

Daily Post-graduate Study.—For those who are able to devote several hours each day to hospital practice the University offers special facilities for Post-graduate work. Qualified medical practitioners may be appointed as Clinical Assistants for a period of one or more months. They may act as Assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Fee, £3 3*s.* per month.

Post-graduate Clinical Work. — Demonstration courses with weekly lectures are held during May, June, and July. Fee, £2 2*s.* All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment at the Pathological Department.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, inter alia, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College of South Wales and Monmouthshire there.

University College of South Wales and Monmouthshire, Cardiff. Welsh National School of Medicine.—This School is staffed on the Unit System, and its Courses of Instruction are open to both men and women students. Students can complete the whole of their curriculum in the School, and qualify for the degrees of M.B., B.Ch. in the University of Wales, and M.B., B.S. in the University of London. Students can also qualify for the Diploma of the Conjoint Board of England. Hospital instruction is given at the Cardiff Royal Infirmary, at the City Lodge Hospital, and at other recognised Institutions. The attention of students about to matriculate is drawn to the numerous entrance scholarships offered for competition at the University College, Cardiff, most of which may be held by medical students. Full particulars of the examination for these may be obtained by application to the Registrar. Medical men wishing to prepare for the Diploma in Public Health or the Tuberculous Diseases Diploma of the University of Wales can attend complete courses of instruction in the School. Prospectuses can be obtained on application to the Dean of the Faculty of Medicine, or to the Secretary, at University College, Cardiff.

Clinical Instruction.—ROYAL INFIRMARY (KING EDWARD VII. HOSPITAL), CARDIFF. 450 beds.—SWANSEA GENERAL AND EYE HOSPITAL: Hospital, 262 beds. Departments: Pathological Laboratory; Venereal Diseases Department; Ophthalmic: Ear, Nose and Throat; Women; X Ray and Massage. Convalescent Home, 26 beds.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable

SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly. Part I. Chemistry. Chemical Physics; Practical Chemistry; Biology. Materia Medica and Pharmacy. Part II. includes Anatomy. Physiology. and Histology. This examination cannot be passed before the completion of twelve months Practical Anatomy with Demonstrations. and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology. and Surgical Anatomy, Operative Manipulation. Instruments. and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology; Forensic Medicine. Hygiene, Theory and Practice of Vaccination; and Mental Diseases. Part III. includes Midwifery, Gynæcology. and Diseases of New-born Children and the Use of Obstetric Instruments and Appliances.

The course of study for the *Final examination*, includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of two winter and two summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the offices of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Two years must elapse after a candidate has passed the examination in Anatomy and Physiology before sitting for any part of the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations. The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical student and medical graduate facilities for different forms of instruction and clinical observation. In each case further information can be obtained from the secretary of the hospital.

THE SEAMEN'S HOSPITAL SOCIETY possesses four hospitals—the *Dreadnought* Hospital at Greenwich, 250 beds, and the Branch Hospital in the Royal Victoria and Albert Docks, E., 50 beds; the Hospital for Tropical Diseases, Endsleigh-gardens, 50 beds, London, N.W. 1; Tilbury Hospital, Tilbury Docks, Essex, 21 beds; King George's Sanatorium for Sailors, Bramshott, Hants, 80 beds, and the Angas Home, 30 beds. It has also a Dispensary in the East India Dock-road from which patients are transferred to the hospitals. The London School of Tropical Medicine is attached to the Hospital for Tropical Diseases. Sessions commence approximately Sept. 22nd, Jan. 5th, and April 27th. Students must be qualified Medical Practitioners or be in the fifth year of their medical studies. Accommodation for [illegible] Students. Fully equipped Laboratories are provided for the study of Entomology, Helminthology, Protozoology, and General Medical Zoology.

In conjunction with the Fellowship of Medicine arrangements have been made for a short course extended over four weeks. Secretary: Sir P. J. Michelli, C.M.G.

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Special Departments.—During the past year special departments have been created in genito-urinary and neurological diseases and a fracture department.

Post-graduate Facilities.—In association with the Fellowship of Medicine two-week "refresher" courses have been arranged for March, July, and November in each year. These will include teaching in general medicine and surgery, and special lectures and demonstrations in special subjects.

Further particulars from the Secretary of the Medical Committee at the Hospital.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynæcological, and children's wards, having 190 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin

Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s*., for re-examination after rejection in Section I. £6 6*s*., for re-examination after rejection in either part of Section I. £3 3*s*., for re-examination after rejection in Section II. £3 3*s*. A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subject or subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. (*a*) Pathology, including Morbid Anatomy, Morbid Histology and Clinical Pathology. (*b*) Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from Section I. The fee for admission to Section I. is £4 4*s*.; for admission to Section II., Part I., £10 10*s*.; Part II., £10 10*s*.; Part III., £6 6*s*.; and the re-examination fees are respectively £3 3*s*., £6 6*s*., £6 6*s*., and £4 4*s*.

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First and Second Examinations of the Examining Board, may enter for the Final Examination at the expiration of two years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First and Second Examinations of the Examining Board under the old Regulations, or of the First Examination and Section I. of the Final Examination under the new Regulations may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, and in Tropical Medicine and Hygiene. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, a Colonial, or a Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, London, W.C.

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The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—Every candidate must have attained age of 25 years. He must either have passed the examinations for the licence of the College, or else be a registered medical practitioner who has obtained the degree of Doctor or Bachelor of Medicine at a University recognised by the Censors Board. The examination is directed partly to pathology and partly to the practice of medicine. Credit is also given to candidates who show a knowledge of Latin, Greek, French, or German. Further information may be obtained from the Registrar at the College. The fee for admission as a Member of the College is 40 guineas, except when the candidate for membership is a licentiate of the College, in which case the fee already paid for the licence is deducted from the 40 guineas. The fee for the examination is 6 guineas, which is reckoned as part of the fee for admission in the case of a successful candidate.

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND:

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce and include the examination of patients and the performance of operations on the dead body. The First Examination will in future years be held in June and December and the Second Examination in May and November.

The fees for examination are:—First Examination, first admission 8 guineas, and for each re-admission 5 guineas. Second Examination, each admission, 12 guineas. Of such examination fees 20 guineas will be reckoned as part of the fee payable upon admission to the Fellowship. The fee to be paid upon admission to the Fellowship is 30 guineas, except when the candidate is a Member of the College, in which case the fee is 20 guineas.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First and Second Examinations of the English Conjoint Board, of the equivalent examinations in his University, on the production of certificates of attendance upon certain prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing satisfactory evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

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SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly. Part I. Chemistry, Chemical Physics: Practical Chemistry: Biology, Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the event of the candidate having previously passed in one.

The Final examination is held monthly except in September. Part I. Clinical Surgery: Principles and Practice of Surgery, Surgical Pathology, and Surgical Anatomy, Operative Manipulation, Instruments, and Appliances. Part II. Clinical Medicine: Medicine, Pharmacology, Pathology, and Morbid Histology: Forensic Medicine, Hygiene, Theory and Practice of Vaccination: and Mental Diseases. Part III. includes Midwifery, Gynæcology, and Diseases of New-born Children and the Use of Obstetric Instruments and Appliances.

The course of study for the *Final examination* includes attendance on the Surgical and Medical Practice, with Post-mortem Examinations, at a hospital connected with a medical school for a period of two winter and two summer sessions, including a course of Practical Midwifery, with attendance on 20 Midwifery cases. The course of medical study must extend over five years, and the offices of dresser or clinical clerk must be held at a hospital or other institution recognised by the Society. Two years must elapse after a candidate has passed the examination in Anatomy and Physiology before sitting for any part of the Final examination.

Evidence shall also be given of practical instruction in Infectious Diseases and in Mental Diseases (at a lunatic asylum or in the wards of an institution containing a special ward set apart for the treatment of mental diseases), and in any two of the following subjects: Ophthalmic Surgery, Laryngology with Rhinology and Otology, Dermatology, and Diseases of Children. Candidates intending to present themselves for examination are required to give 14 days' notice. The fee for the Licence is 20 guineas. Female candidates are admitted to examinations. The examination offices are open from 10 A.M. to 4 P.M.; on Saturdays from 10 A.M. to 1 P.M. All letters should be addressed to the Secretary, Court of Examiners, Society of Apothecaries of London, Blackfriars, E.C. 4.

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical student and medical graduate facilities for different forms of instruction and clinical observation. In each case further information can be obtained from the secretary of the hospital.

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A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

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throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the physicians in the wards. The hospital has been recognised by the Conjoint Board for England as a place where six months of the fifth year may be spent in clinical work. The medical practice of the hospital is also recognised by the University of London, the Apothecaries' Society, and the Army and Navy and Indian Medical Boards. The hospital is open to post-graduates and students and special arrangements have been made with the West London Hospital by which post-graduates can attend both hospitals for a combined fee. Dean of the Medical School: Dr. L. S. Burrell, from whom particulars of lectures, clinical appointments, and hospital practice can be obtained.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E. 2.—During the past year 1131 in-patients have been treated in the wards. The out-patients treated during 1923 numbered 10,056. Special Departments: Surgical, Laryngological, Radiological, Pathological, Electro-Cardiographic. Assistants are appointed to the Clinics, and a limited number of research workers to the Pathological Department. The In-patient staff visit generally in the afternoon; Out-patients at 2 p.m. The Post-Graduate Association is open to graduates on payment of fee of 1 guinea per annum, which entitles them to attendance at clinics, post-mortem demonstrations, and operations. Special demonstration and lecture courses are provided, particulars of fees for which can be obtained from the Dean. A club room is also provided. Application for prospectus, &c., should be made to the Dean. Graduates desiring Assistantships in any department should apply to the head of the Department. Physicians to In-patients: E. H. Colbeck, Clive Riviere, A. G. Levy, A. J. Scott-Pinchin, F. G. Chandler, Sir Percy Bassett-Smith; Surgeon: W. H. C. Romanis; Laryngologist: W. G. Howarth; Physicians to Out-patients: J. B. Alexander, J. B. Christopherson; Electro-Cardiographic Department: A. J. Scott-Pinchin; Radiologist: (Vacant); Pathologist: S. R. Gloyne; Assistant Pathologist: D. S. Page; Dental Surgeon: W. Elder. Tuberculosis Dispensary (Boroughs of Bethnal Green and part Hackney). Tuberculosis Officers: H. T. Howell and F. W. Hamilton. Other information from the Secretary of the Hospital.

Royal Chest Hospital (for all affections of the heart and lungs), City-road, E.C. (80 beds). Branch of the Royal Northern Hospital, Holloway.—This hospital provides accommodation for 80 in-patients. Expenditure for 1923, £14,095 18*s.* 3*d.*; income, £12,812 17*s.* 3*d.* The attendance of out-patients averages 30,000 annually. Secretary: Mr. G. G. Panter.

The Mount Vernon Hospital for Tuberculosis and Diseases of the Lungs and Heart, Northwood, Central Out-patient Department, Fitzroy-square, W.—The hospital contains 150 beds, Medical and Surgical; 50 beds reserved for children requiring surgical aid. Number of in-patients, 464: out-patients, 1876. Resident Medical Staff. Clinical Demonstrations are given by the Visiting Medical Staff at the hospital at Northwood. Clinical assistants are appointed to physicians in the wards and in the out-patient department. Secretary: Mr. W. J. Morton.

Queen Charlotte's Maternity Hospital (formerly Queen Charlotte's Lying-in Hospital) and Midwifery Training School, Marylebone-road, N.W.—This hospital receives about 2000 patients annually, besides having a large out-patient department. Medical pupils are received at all times of the year. Pupils have unusual opportunities of seeing obstetric complications and operative midwifery, on account of the very large number of primiparous cases—nearly one-half of the total admissions. Clinical instruction is given on the more important cases which present themselves. They also receive valuable instruction in the Ante-natal Department, where over 4000 patients attend yearly. Special Lecture-demonstrations are given by members of the staff. Certificates of attendance at this hospital are recognised by all the Universities, Colleges, and licensing bodies. Pupil midwives and maternity nurses are received and specially trained. A Residential College provides accommodation for five men at a time, students and qualified practitioners, and is opposite the hospital, with which it is in telephonic communication. Arrangements have been made for Medical Students to receive the preliminary instruction in Practical Midwifery recommended by the General Medical Council. Women students are received. For further particulars application should be made to Mr. Arthur Watts, Secretary, at the hospital.

Hospital for Women, Soho-square, W.—The teaching in connexion with the above hospital has been greatly extended, and is available for Post-Graduates only, in limited numbers. Every facility is afforded them, by the teaching staff, of obtaining experience in diagnosis and treatment of Gynæcological diseases. The hospital contains 68 beds, and the out-patient attendances are over 14,000 per annum. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated with the hospital is the London School of Gynæcology, comprising attendance in Out-patient Department, operating theatre, clinical lectures, and X ray treatment. For further particulars apply to the Secretary.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. The fees, payable in advance, are £3 3*s.* for three months. Full particulars may be obtained on application to the Secretary at the hospital. There are 70 beds. Secretary: Mr. G. H. Hawkins.

East London Hospital for Children and Dispensary for Women, Glamis-road, Shadwell, E. —The hospital maintains 130 cots, and on an average 245 out-patients are seen daily. Clinical instruction is given by the physicians and surgeons to the hospital, which is recognised by the Conjoint Board for England as a school of medical teaching for students in the fifth year of the curriculum. All particulars may be obtained on application to the Secretary. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to Mr. W. M. Wilcox, the Secretary.

The Hospital for Sick Children, Great Ormond-street, W.C. 1, contains 244 beds. The hospital having been recognised by the Conjoint Board for England as a place where, under the new curriculum, six months of the fifth year may be spent in clinical work, the practice is arranged to meet this need and is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to eight medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Fees for hospital practice, one month, £2 2*s.*; three months, 5 guineas; perpetual ticket, 10 guineas. Clinical Clerks, 1 guinea for one month. Ophthalmological Clerkships.—Clinical Clerks are appointed once a month. Fees £1 1*s.* for one month's attendance. Pathological Clerkships.—Facilities are afforded for diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and out-patient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are four resident medical officers, and clinical assistants are appointed under certain conditions. Special intensive post-graduate courses are held at intervals throughout the year. Further particulars in regard to the hospital may be obtained from Mr. E. Gillespie, Secretary to the Medical Committee, 24, Weymouth-street, W. 1; or from Dr. A. J. Whiting, Dean of the North-East London Post-Graduate College, 19A, Cavendish-square, W. 1.

London Temperance Hospital, Hampstead-road, N.W. (Established 1873; Incorporated 1917).—The hospital contains 120 beds. The in-patients in 1923 were 631, and the out-patients and casualties numbered 11,559 new cases. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Mondays at 2 P.M., Tuesdays, Wednesdays, Thursdays, and Fridays at 9 A.M.

Hampstead General and North-West London Hospital.—The Hampstead General Hospital (Haverstock-hill) and the North-West London Hospital (formerly at Kentish Town) have been amalgamated since 1907. The Hampstead General Hospital (128 beds—viz., 102 free, 6 isolation, &c., and 20 paying or contributory) accommodates the in-patients from the districts hitherto served by both hospitals. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital.

South London Hospital for Women, South Side, Clapham Common, S.W.; Out-patient Department: 86-90, Newington Causeway, S.E.—This hospital, officered entirely by medical women, is a general hospital for women, girls, and small children of both sexes, and provides accommodation for 115 patients. All diseases are treated with the exception of acute infectious fevers and mental disease. There are Ophthalmic, X ray and Electrical, Pathological, Physio-Therapeutic, and Dental Departments. The hospital is a centre for the treatment of venereal diseases under the Public Health (Venereal Diseases) Regulations, 1916. The provision of additional facilities for post-graduate training for medical women is one of the special objects of the hospital. The number of in-patients treated during the year 1923 was 1277. At the Out-patient Department in Newington Causeway 9077 new cases were treated during the past year, the total number of out-patient attendances amounting to 36,300. Clinical assistants (qualified women only) are from time to time appointed in the Out-patient Department. Two resident students act as clinical clerks in the surgical wards. Secretary: Miss M. E. Ridler.

French Hospital and Dispensary, Shaftesbury-avenue, W.C.—This hospital, which was founded in 1867 to afford medical treatment for poor foreigners who speak the French language, has 74 beds. The Convalescent Home and Retreat for Aged French People at Brighton contains 61 beds. Secretary: Mr. J. Knecht.

Italian Hospital, Queen-square, W.C.—This institution was established in 1884 for the maintenance and medical treatment of Italian and Italian-speaking people, irrespective of their religious and political opinions, who may be suffering from sickness or bodily infirmity, but the sick poor of any nationality are also admitted for treatment. The institution also provides surgical and medical relief to Italians and others not being inmates of the hospital. It has 50 beds.

German Hospital, Dalston, E. 8.—This hospital was founded in 1845 with the object of supplying medical aid to poor people speaking the German language and for others in cases of emergency and accident. It has 154 beds and a sanatorium with 10 beds; also a Convalescent Home at Hitchin.

National Hospital for the Paralysed and Epileptic (Albany Memorial), Queen-square, Bloomsbury, W.C.—The hospital, with the Convalescent Home at East Finchley and branch at Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 P.M., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuro-Pathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist. The hospital has been recognised by the Conjoint Board of England as a place where part of the fifth year may be devoted to clinical work. All communications concerning clinical appointments, lectures, hospital practice, and fees should be addressed to the Secretary at the hospital.

Hospital for Epilepsy and Paralysis, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. Secretary and General Superintendent: Mr. H. W. Burleigh. The out-patient department is open every week-day except Saturday at 2 P.M.

West End Hospital for Nervous Diseases.—Out-patient Department, Welbeck-street, W.; In-patient Department, Gloucester Gate, Regent's Park, N.W.; 76 beds, over 47,000 out-patient attendances. Complete reconstruction has recently been effected and the hospital offers all facilities for instruction in Neurological subjects. A series of clinical demonstrations, apart from the general practice of the hospital, is held regularly each session, and the hospital is coöperating with the Fellowship of Medicine in the programme of special post-graduate teaching organised by the Association. The Savill Memorial Prize (value £15) and Medal are offered annually for competition among post-graduate and undergraduate students who have attended at the hospital. For further particulars apply to C. C. Worster-Drought, M.D. (Dean), or to J. P. Wetenhall, B.A., Secretary, 73, Welbeck-street, W. 1.

Bethlem Royal Hospital, St. George's-road, S.E.—This hospital is open for the admission of two Resident House Physicians who have recently obtained their diplomas to practise Medicine and Surgery. They are permitted to reside in the hospital for a term generally not exceeding six months, commencing May 1st and Nov. 1st, and are provided with apartments, complete board, attendance, laundry, and a salary at the rate of £100 per annum. They are under the direction of the Physician Superintendent and are elected by the Committee from candidates whose testimonials appear to be most satisfactory. The students of certain specified London Medical Schools receive clinical instruction in the wards of the hospital and qualified practitioners and other students may attend for a period of three months on payment of a fee. A Department for Nervous Diseases has been instituted in a building quite apart from the main hospital. Neurological and early mental cases are dealt with. A Course of Lectures and Practical Instruction for the Diploma in Psychological Medicine granted by the various Universities, will commence in the middle of September. For particulars apply to the Physician Superintendent.

Hospital for Consumption and Diseases of the Chest, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital: terms £1 1*s*. for one month; three months, £2 2*s*. Clinical Demonstrations are given

CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, St. Pancras, W.C.—This hospital has 40 beds and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on refraction and other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. The out-patient work begins at 1 o'clock, and operations are performed daily between 2 and 4 o'clock. This school is recognised as a teaching institution by the Universities of London and Oxford, and the Conjoint Board of the Royal Colleges of Surgeons and Physicians. The school has also undertaken to receive a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. Secretary: H. R. S. Druce.

WESTERN OPHTHALMIC HOSPITAL, Marylebone-road, N.W.—16 beds. Out-patient attendances, 30,264. Both In-patient and Out-patient Departments of this Hospital are open to medical graduates. Fees £1 1s. per three months. Honorary Secretary: H. W. Burleigh.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, London, W. (founded 1857).—The practice of the hospital, both in the wards and out-patient department, is open daily to post-graduates and others, and will be found valuable by those seeking the higher qualifications—e.g., M.D., M.R.C.P., &c. Systematic courses of instruction, with lectures and clinical demonstrations, are arranged during the winter and summer sessions; in addition an intensive course, of a fortnight's duration, takes place in January, July, and October of each year. The hospital is fully equipped with all the modern instruments for the investigation of the diseases of the Cardio-Vascular system, and facilities exist for those requiring practical instruction in Electro-cardiography, X Rays, and other graphic methods. Clinical Assistants in the Out-patient Department are appointed from time to time. For further particulars apply to the Dean of the Medical School (Dr. Parsons-Smith), or to the Secretary, at the hospital.

HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. (with which is amalgamated the London Throat Hospital, Great Portland-street).—Clinical instruction in the diagnosis and treatment of disease is given daily in the out-patient department from 2 to 5 P.M., and on Tuesdays and Fridays from 6.30 to 9 P.M. There is an annual out-patient attendance of over 60,000. Minor operations are performed on Tuesdays, Wednesdays, and Thursdays, at 9.30 A.M. The hospital has been closed for some time owing to rebuilding operations, and the wards and in-patient operating theatres are not yet open. When completed the hospital will contain some 80 beds. Practitioners and medical students are admitted to the practice of the hospital at a fee of £5 5s. for three months, £7 7s. for six months, or £10 10s. for perpetual studentship. From amongst the students junior clinical assistants are appointed periodically. For terms and further information apply to the Dean, Mr. Gilbert Chubb.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.—The practice of the hospital is largely consultative. The hospital is open daily to all qualified medical practitioners on presentation of their visiting cards. Demonstrations of the cases and clinical instruction are given daily by the chief surgeon of each clinique. An Intensive Course of Lectures with demonstrations of cases is given twice yearly—in May and October. Consultations on interesting cases take place on the second Wednesday in each month at 4 P.M. Clinical Assistants are appointed and are expected to hold office for at least three months. They are required to attend twice weekly at 1.30 o'clock for the afternoon, and at 4.30 o'clock for the evening Clinics. Full syllabus can be obtained on application to the Dean.

THE METROPOLITAN EAR, NOSE, AND THROAT HOSPITAL.—The hospital is in Fitzroy-square, W. The Out-patient Department is opened daily (Saturdays excepted) at 2.30 P.M. to all medical practitioners and senior students for acquiring clinical instruction and technical knowledge. Operations upon in-patients are performed on Tuesdays, Wednesdays, and Thursdays at 10 A.M. Fee for one month's attendance at the hospital £3 3s., and for three months £5 5s. Clinical Assistants are appointed as vacancies occur, and have responsible duties. Applications should be made to the Secretary, L. L. Phillips.

ROYAL EAR HOSPITAL.—This hospital is now the Ear, Nose and Throat Department of University College Hospital. All out-patient clinics are now held at University College Hospital in Gower-street, but ward visits and operations by the staff take place each afternoon (except Fridays and Saturdays) at Dean-street.

ST. MARK'S HOSPITAL FOR CANCER, FISTULA, AND OTHER DISEASES OF THE RECTUM, City-road, E.C. (Founded 1835.)—The hospital contains for men and women 54 beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Average out-patient attendances, 4000 per year. Average in-patients, 675 per year.

ST. PETER'S HOSPITAL FOR STONE AND OTHER URINARY DISEASES, Henrietta-street, Covent Garden. Established 1860. New Hospital opened 1882.—The hospital contains 30 beds for men and 2 beds for women and children. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, excepting that the only out-patient clinic open to medical women is that held at 2 P.M. Fridays for women and children, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Average beds occupied daily, 30; average out-patients seen daily, 100.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, AND THE LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C. 2.—The in-patient department, 40 beds, is at 262, Uxbridge-road, W. 12. The out-patient practice is open to the medical profession every day at 2 and every evening (except Saturday) at 6. At all clinics demonstrations on the different diseases presenting themselves are given. Venereal Diseases, under the Government scheme, are admitted at all clinics. The X ray Department is open on Monday, Tuesday, Thursday, and Friday afternoons. The Chesterfield Lectures are given on Tuesdays and Thursdays at 5 P.M., October to March, commencing Oct. 7th., with an introductory lecture by Dr. James H. Stowers. At the end of the course the Chesterfield medal may be competed for by those who have attended three-fourths of the lectures. Special laboratory courses in Pathology and Bacteriology of the Skin may be arranged for. For fees and further information apply to the Dean, Dr. M. G. Hannay.

LONDON LOCK HOSPITAL AND HOME (Founded 1746).—In the Institution at Harrow-road, W. 9, there are 202 beds, and 532 in-patients and 7697 (attendances) out-patients were dealt with in 1923. In the Male Department and Out-patient Department in Dean-street, Soho, W., there are 42 beds, which during 1923 accommodated 384 patients. 90,483 (attendances) out-patients were made in the various departments. 3064 injections of substitutes for salvarsan, &c., were made in 1923. Male patients are seen at 91, Dean-street on Mondays and Tuesdays from 1 to 2 P.M., and from 6 to 8 P.M.; on Wednesdays from 6 to 8 P.M.; on Thursdays, 1 P.M. (male out-patients), 5 P.M. (female patients); on Fridays from 5 to 7 P.M. (male patients); and on Saturdays from 2 to 4 P.M.

obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees: For one month, £3 3*s.*; for two months, £5 5*s.*; for three months, £6 6*s.* A reduction is made in the case of those already holding tickets for general attendance at the hospital. Time so spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, and by the Conjoint Board for England as part of the approved curriculum for students entering for a final examination. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily. Details may be obtained by application to the Dean or Secretary at the hospital. The medical school is a constituent part of the new London Post-Graduate Association. Secretary: Mr. James McKay.

Evelina Hospital for Sick Children, Southwark Bridge-road, S.E.—This hospital contains 76 cots and a very extensive Out-patient Department. Clinical assistants (either sex), to work with the Honorary Medical Staff for Out-patients, may be appointed quarterly for a period of three months; there is no salary attached to these posts; but, on the other hand, no fees are charged.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—The hospital contains 130 beds and has a large out-patient department (over 1400 weekly); the home at Broadstairs has 50 beds. Out-patients are seen as under:—Diseases of the Eye: Tuesday, 2 p.m. Diseases of the Skin: Monday, 1.45 p.m. Whooping-cough Cases: Friday, 2 p.m. Dental Cases: Thursday, 1.30 p.m. Medical and Surgical Cases: Mornings at 9.30 and 11.30. Accidents and urgent cases are admitted at any time. Secretary: Mr. D. St. John Bamford.

A Private Nursing Home for Children is now open at 29, Tite-street, in connexion with and adjacent to the hospital. Terms: £1 1*s.* per day or £5 5*s.* per week. Application for admission should be made to the Secretary. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is a matter of arrangement between him and the child's parents.

Queen's Hospital for Children (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E. 2. (Telephone 305 and 534 Dalston.) For the sick children of the poor under 14 years of age. Established 1867. 134 beds in London and 36 at the seaside branch, "Little Folks" Home, Bexhill.—During the past year 1786 in-patients and 37,901 out-patients (attendance 129,649) were received. The surgeons attend on Monday, Tuesday, and Friday at 9 a.m., and on Thursday at 1.30 p.m.; the physicians daily at 1.45 p.m., except Saturday, and also Wednesday and Friday, 9.30 a.m., as well as 1.45 p.m. Whooping-cough Physician: Saturday, 9.30 a.m. The practice of the hospital is open to students by arrangement with the medical staff. Post-Graduate instruction in Children's Diseases, Lectures and Demonstrations, August 11th to 23rd. Skin Physician: Friday, 1.30 p.m. Ear, Nose, and Throat Surgeons: Monday, Tuesday, and Thursday, 9.30 a.m. Eye Surgeon: Wednesday, 1.30 p.m. X ray department open every day. Radiologist attends Monday, Tuesday, Wednesday, and Friday, 2 p.m. Dental department every morning, 9.30, except Saturday; also on Tuesday and Friday, 2 p.m. Massage department daily, morning and afternoon (except Saturday afternoon). Applications should be made to the Secretary, Mr. T. Glenton-Kerr.

Belgrave Hospital for Children, Clapham-road, S.W.—Clinical Assistants (men or women) are from time to time appointed to the members of the Visiting Staff attending in the Out-patient Department at this hospital, and facilities are given for attendance in the wards.

Alexandra Hospital for Children with Hip Disease (late of Queen-square, W.C.), Kettlewell Home, Swanley, Kent (in connexion with St. Bartholomew's Hospital).—At this hospital cases of hip-disease, spinal caries, and tuberculous diseases of other bones and joints are treated. Students who have obtained a recommendation from their teachers can attend to see the practice. In-patients, Swanley, Kent; Out-patients, St. Bartholomew's Hospital; Fridays, 1.30 p.m. Apply for particulars to the Dean of the Medical College, St. Bartholomew's Hospital, London, E.C. 1.

Royal London Ophthalmic Hospital (Moorfields, 1804–1899), City-road, E.C. 138 beds.—This hospital, known as Moorfields Eye Hospital, was moved in 1899 to larger buildings in City-road. Last year there were 2601 in-patients, the out-patients were 50,079, of whom 43,521 were new out-patients, and the attendances were 120,552. Operations are performed daily from 10 a.m. to 1 p.m., and four surgeons attend on each day. Students are admitted to the practice of the hospital. Fee for six months, £3 3*s.*; perpetual, £5 5*s.* Special courses of instruction, which extend over a period of five months, are given by members of the Surgical Staff; beginning in October and March. A composition fee of 24 guineas (£25 4*s.*) will entitle students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. A special course is also held in the preliminary subjects (Anatomy, Physiology, and Optics) for the various degrees in Ophthalmology. The fee for this course is 12 guineas. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months. Any further information will be furnished by Mr. Robert J. Bland, Secretary Superintendent.

Royal Westminster Ophthalmic Hospital, King William-street (next door to Charing Cross Hospital), Strand, W.C. 2.—The hospital contains 42 beds. Out-patients, who number over 14,000 annually, are seen daily at 1 p.m., and operations are performed in the theatre at 3 p.m. The practice of the hospital is open to both men and women practitioners and students. Clinical evenings, at which interesting cases are shown and discussed, are held twice each term at 8 p.m. on the second Tuesday of the month. In addition to the ordinary clinical instruction, a systematic course of Lectures and Practical Classes commences in October and May. Lectures in this course are given daily (except on Saturday) at 4.30 p.m., including all subjects required by candidates for the D.O.M.S., R.C.P. & S. Eng., Part II., and practical instruction is given in Operative Surgery and Ophthalmic Pathology and Bacteriology. A corneal microscope has recently been purchased and instruction in the Microscopy of the Living Eye can now be obtained. Fees: One month, £1 1*s.*; three months, £2 2*s.*; six months, £3 3*s.*; perpetual, £5 5*s.*; composition fee for perpetual ticket and attendance at classes (except Operative Surgery and Pathology, for which fee in each case is £2 2*s.* per course), £10 10*s.* Students of the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant, and senior or junior clinical assistant. Full details can be obtained on application to the Dean.

Royal Eye Hospital, St. George's-circus, Southwark, S.E. 1.—There are 40 beds and 2 cots. In 1923 there were 51,958 attendances in the Out-patient Department, the new patients being 21,892. The daily average of attendances was 172 patients. In-patient admissions numbered 840. Clinical instruction is given to students and post-graduates daily at 2.30 p.m., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. Dean: Mr. A. D. Griffith.

buildings and alterations. A new Out-patient Department, costing £12,000, a new Children's Ward of 30 beds, a new Pathological Department, and a second large Operation Theatre are amongst the structural improvements already completed. The whole institution is now equipped in a thoroughly up-to-date manner. An Electro-Cardiograph is just about to be installed. Secretary and House Governor: Mr. W. Stevenson.

HULL ROYAL INFIRMARY, Hull.—This Hospital contains 266 beds, and since its establishment in 1782 until the erection of the circular wards in 1907 has undergone steady additions and improvements, including an up-to-date pathological department recently added. A branch convalescent home at Withernsea is a special feature of the charity.

LEICESTER ROYAL INFIRMARY, Leicester.—Instruction in the infirmary for first-year students is duly recognised by the various examining bodies. At the General Infirmary there are 233 beds, and at the Children's Hospital in connexion 70; venereal diseases, 17. A new wing containing 100 beds has recently been added: total 420 beds. A reconstruction scheme has been carried out, and £250,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Open-air balconies on all three floors are a feature. A central sterilising department has been provided. Pathological Laboratories and post-mortem rooms have recently been opened at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms. The 150th anniversary of the Institution has recently passed and an effort was made to raise a sum of £100,000 in commemoration. Funds are being raised for the foundation of a City University, and a splendid site was presented by the late Mr. T. Fielding Johnson, J.P., an ex-chairman of the Royal Infirmary. There are eight resident salaried medical officers at the Infirmary—viz., four house surgeons, one house physician, one assistant house physician, and two dressers. The posts are usually filled half-yearly and afford exceptional opportunities for post-graduate experience and senior students. Dressers are given an honorarium. Students are encouraged to make full use of the facilities which exist to gain clinical knowledge in the wards. The hon. medical and surgical staff are wishful of affording instruction in a variety of conditions which an active and well-equipped general hospital in a large commercial centre is called upon to treat. A post-graduate course of lectures is arranged annually, and also clinical classes are held for those graduates preparing for the M.D. and M.R.C.P. A new Residency for Doctors has been erected. Chairman of the Board: Mr. J. G. Pickard. Deputy Chairman ot the Board: Lieut.-Col. C. F. Oliver, D.L., V.D. House Governor and Secretary: Mr. Harry Johnson, from whom information as to prospective vacancies on the Resident Staff may be obtained.

NORTHAMPTON GENERAL HOSPITAL, Northampton.—Two new wings were opened in 1904 and the old buildings entirely renovated and rearranged. The number of beds is 231, 34 of which are occupied by discharged disabled pensioners. Non-resident pupils received and have every opportunity of acquiring a practical knowledge of their profession. The fee is £10 10s. Pupils can be received at any time. An up-to-date Pathological Laboratory has recently been erected.

NORFOLK AND NORWICH HOSPITAL, Norwich.—This hospital has at present 300 beds. There is a convalescent home at Cromer. Students are admitted to the practice of the Hospital for a fee of £5 5s. for six months. Secretary: Mr. Frank Inch.

NOTTINGHAM GENERAL HOSPITAL.—There are at this hospital 310 beds available for medical and surgical patients, and 46 beds are in the detached ward known as "The Cedars" Convalescent Hospital. The Medical and Surgical Staffs consist of 2 Honorary Consulting Physicians; 3 Honorary Consulting Surgeons, 1 Honorary Consulting Physician in Venereal Diseases; 3 Honorary Physicians; 4 Honorary Surgeons; 2 Honorary Assistant Physicians; 2 Honorary Assistant Surgeons; 2 Honorary Aural Surgeons; 1 Honorary Dermatologist; 2 Honorary Anæsthetists; 1 Honorary Surgeon Dentist and 1 Honorary Medical Officer in Charge of X ray and Electro-therapeutic department. The Resident Medical Staff consists of 2 House Physicians, 4 House Surgeons, 1 Aural House Surgeon, and 1 Casualty Officer. The special departments are the Ear, Nose and Throat, Skin, Dental, Massage and Exercise, X ray, Orthopædic, Electro-therapeutic. House Governor and Secretary: Mr. P. M. MacColl. Assistant Secretary: Mr. T. H. G. Gartland.

SOUTH DEVON AND EAST CORNWALL HOSPITAL, Plymouth.—This hospital contains 190 beds (14 of which are for Venereal Diseases in a separate building). There is also an Out-patient Venereal Diseases Clinic. There is a Pathological Laboratory, special departments for X ray and Electro-therapeutics, an Out-patient Orthopædic Clinic under the Ministry of Pensions, and a civil Orthopædic Department. Pensioners are received as in-patients. The hospital is a centre for the treatment of Tropical Diseases.

ROYAL HOSPITAL, Portsmouth (founded 1847).—The number of beds is 160. There are X ray and Massage Departments. The hospital is a preparatory school of Medicine and Surgery; the attendance of pupils is recognised by the Examining Boards. Particulars of the Secretary at the hospital.

ROYAL BERKSHIRE HOSPITAL, Reading.—This hospital, which contains 220 beds, was enlarged in 1912, and includes an Out patient Department, a Casualty Department, an X ray Department, Electro-therapeutic and Massage Department, a V.D. clinic, a Laboratory, an Eye Theatre, Eye Wards, and Motor and Horse ambulances. The hospital is approved by the General Nursing Council as a Training School for Nurses. Post-Graduate Lectures are given.

SALISBURY GENERAL INFIRMARY, Salisbury.—This hospital contains 141 beds. The daily average number of in-patients is 116; number of new out-patients, 4827; number of out-patient attendances, 25,129, including 9276 casualties, 1579 medical and surgical out-patients, 505 ear, nose and throat cases, 1183 ophthalmic cases, 717 dental cases, 3360 venereal cases, 1028 X ray cases, and 7481 massage and electrical cases. Special features: Maternity and ante-natal, ophthalmic and private wards. House Governor and Secretary: John S. Birbeck.

ROYAL SALOP INFIRMARY, Shrewsbury.—This hospital has 130 beds. In-patients, 2524; out-patients, 1786; out-patients' attendances, 22,310; accidents and casualties, 4035; dental cases, 645. A site has been purchased adjoining the present Infirmary structure, and it is proposed to erect an annexe for women and children thereon. Secretary: Mr. Alfred Sugden. The above statistics refer to the 18 months' period July 1st, 1922, to Dec. 31st, 1923.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, Southampton.—This hospital contains 130 beds. In-patients, 3059; out-patients, 12,987. Secretary: Mr. T. A. Fisher Hall.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford (established 1766).—This hospital has 87 beds. In-patients, 958; out-patients (new cases), 2610. Secretary: Lieutenant A. E. Collins.

ROYAL HANTS COUNTY HOSPITAL, Winchester.—This hospital has 158 civilian beds. Secretary: Mr. Herbert Maslen.

(males). Pathological Department, daily at 6.30 P.M. Intravenous injections are given at every clinic. Female clinics are held at 283, Harrow-road, Paddington, on Mondays at 10 A.M., Tuesdays, Wednesdays, and Thursdays at 2 P.M. to 3 P.M. The new female out-patients department is open all day long from 9 A.M. to 8 P.M. Irrigations for males are given daily 8 A.M. to 10 P.M. For females Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 11 A.M. to 1 P.M., at 91, Dean-street. The Hospital is linked up with the Fellowship of Medicine, and special courses of lectures are held in February, May and November each year. Application for tickets should be made direct to the Secretary. Only a limited number of practitioners and students are permitted to attend the Female Lock Hospital, and application should first be made to Major Corbett (Dean) at the Male Lock Hospital; or to the Secretary, Hy. J. Eason, at the Chief Offices, 283, Harrow-road, W. 9.

ENGLISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

Under this heading we include all the hospitals which are recognised by the English Royal Colleges for a part of the required attendance on medical and surgical practice, for medical clerkships, and surgical dresserships. The list includes nearly every hospital of a general character in the country having more than 150 beds, though occasionally a large hospital is omitted because equally good opportunities are afforded to students at other institutions in its neighbourhood, while a small hospital may be included because no such facilities for study are present elsewhere. The list is arranged alphabetically as to the town where the hospital is located. Most of the larger general hospitals of the kingdom have already been noticed in connexion with the Universities.

Bath Royal United Hospital, Bath.—This hospital contains 206 beds, 72 of which are situated in Combe Park, Bath, and are for *paying patients* only, and possesses X ray, Massage, Bacteriological Departments, a new Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), from 5 to 6.30 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

Bedford County Hospital, Bedford.—This hospital has 109 beds, including 15 beds in the paying wards, X ray and Pathological Departments. There is in connexion with the institution a convalescent home (20 beds) at Aspley Heath, nr. Woburn Sands. The hospital is approved by the University of London for the purposes of the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary, Bradford. — This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynæcological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopædic and Venereal cases. Plans for a new hospital of 382 beds have been adopted, and building operations will be commenced as soon as funds will allow.

Royal Sussex County Hospital, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X ray, and Orthopædic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Kent and Canterbury General Hospital, Canterbury.—The hospital contains 115 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopædic Department, &c. Secretary, Mr. F. P. Carroll.

Coventry and Warwickshire Hospital, Coventry (established 1840).—This hospital contains 241 beds, and a new wing as well as theatre and kitchens have been added. Special clinics are held for diseases of the Eyes, Ears, Nose and Throat; Gynæcology; X ray and Electrical Treatment. There are also V.D. Clinics. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

Derbyshire Royal Infirmary, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892–1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a separate children's block of 34 beds, and a special department for gynæcological cases. There are four resident house surgeons, a resident house physician, and an assistant house surgeon and casualty officer. There are also well-equipped orthopædic, X ray, electrical, and venereal diseases departments. Registered medical students are admitted to witness the medical and surgical practice on payment of 10 guineas annually.

Royal Devon and Exeter Hospital, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum, post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. This department is now enlarged to meet the ever increasing work, and now forms one of the most important sections of the hospital. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

West of England Eye Infirmary, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1923, 3387. A ward is set aside for newly-born babies suffering from infectious eye diseases. The mothers are accommodated with their babies.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: G. Hurford. In-patients, 1808; out-patients, 9044. An electrical and massage department has been established and venereal clinic opened. Also ear, nose and throat department, X ray department, and dental department.

North Staffordshire Infirmary, Hartshill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 304 patients, including Children's wards, and a special department for the treatment of Diseases of the Eye, a special X Ray and Electrical Department, a special department for the treatment of Diseases of the Ear, Nose, and Throat, a special orthopædic department, and venereal diseases clinics, so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last six years the sum of £35,000 has been spent on new session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards.

The practical classes and laboratories will open and the lectures commence on Oct. 14th.

In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school.

Special courses of instruction for dental students are also included in the curriculum of this school.

The minimum cost of the education in this School of Medicine for the Triple Qualification of Physician and Surgeon from the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, including the fees for the Joint Examinations, is about £170, payment of which is distributed over the period of study. There is no composition fee.

Post-graduate Courses are conducted in conjunction with the University.

Further particulars regarding the school, also its calendar (price 6*d.*) may be had on application to the Dean of the School, 11, Bristo-place, Edinburgh.

In connexion with the University and Royal Colleges Post-Graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

Clinical Instruction.—ROYAL INFIRMARY, Edinburgh.—This hospital has 921 beds and 42 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There are also large and complete Medico-Electrical and X Ray Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology. The fees for hospital attendance are as follows—viz.: Perpetual ticket, in one payment, £12; annual ticket, £6 6*s.*; six months, £4 4*s.*; three months, £2 2*s.*; monthly, £1 1*s.* Separate payments amounting to £12 12*s.* entitle the student to a life ticket. The appointments are as follows: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department are appointed by the pathologist.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—This hospital contains 120 beds, and is fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily in a building adjoining the hospital. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given from time to time throughout the year by the staff. Students may enter at any time. Post-graduate Courses of Lectures are held during the year. Full particulars can be obtained from the Registrar at the hospital.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for out-door patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Patients whose diseases require operations or more than ordinary care are accommodated in the house. Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A post-graduate course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences on Oct. 14th, 1924. The class meets at 5 P.M. Tuesdays and Fridays, and the instruction, which is essentially practical, is supplemented by lantern demonstrations. Secretary: Mr. J. P. Watson, W.S., 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: M.B. and Ch.B. (always conjointly), M.D. and Ch.M.; B.Sc. in Public Health; D.Sc. in Public Health: B.Sc. in Pharmacy; and Ph.D. in the Faculty of Medicine. A Diploma in Public Health (D.P.H.) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required after registration as a medical student in the books of the General Medical Council. The candidate must, during his curriculum, have attended a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine, and the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of

WOLVERHAMPTON AND STAFFORDSHIRE HOSPITAL, Wolverhampton.—There are 210 beds. Special departments for Children, Infectious cases, Gynæcology, Ear, Throat, and Nose Diseases, Electrotherapeutic and X ray, Venereal Disease, Pathological Laboratory, Dentistry, and Electro-cardiographic Installation. There is an excellent library. The resident officers are a resident surgical officer, resident medical officer, and two house surgeons. Pupils are allowed to witness the whole of the practice of the hospital and to be present at operations and have every opportunity of acquiring a practical knowledge of their profession. A course of Practical Pharmacy is given by the dispenser. Fees on application. Applications should be made to the Honorary Secretary of the Medical Committee. In 1923, 3537 in-patients and 23,939 out-patients were treated; 3780 operations were performed in the theatres.

WORCESTER GENERAL INFIRMARY, Worcester.—This hospital has 132 beds (temporarily reduced to 70). Pupils are taken by members of the Honorary Medical and Surgical Staff. Number of operations last year 930. New X ray and Electrical and Wolfram Arc Light, Ear, Nose and Throat, and Orthopædic Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII. In-patients, 1254; out-patients, 3901. Secretary: Mr. E. J. Holland.

YORK COUNTY HOSPITAL, York.—This hospital contains 180 beds. There are balconies for outdoor treatment, two installations of X ray apparatus, electro-therapeutic and massage department, and clinical laboratory. A Venereal Diseases Clinic is held.

SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The subjects of the Qualifying examination of the Pharmaceutical Society are:—Part 1: (*a*) Chemistry; (*b*) Physics; (*c*) Botany. Part 2: (*a*) Materia Medica: (*b*) Pharmacy, including Posology and the Translation and Dispensing of Prescriptions; (*c*) the law relating to the keeping, selling, and dispensing of poisons and poisonous substances. Fee, 12 guineas; for each subsequent examination after failure, 3 guineas. The advanced or Major examination (for registration as "pharmaceutical chemist") includes botany, chemistry, physics, practical chemistry, and materia medica. Fee, 3 guineas. The courses of instruction given in the Society's school cover the entire ground for both examinations. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates in Science may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories. Application for admission to the school, or for further information, may be made to the Dean, Prof. Greenish, 17, Bloomsbury-square, London, W.C. 1.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The degree of Bachelor of Surgery cannot be conferred on any person who does not at the same time obtain the degree of Bachelor of Medicine, and similarly the degree of Bachelor of Medicine is not conferred on any person who does not at the same time obtain the degree of Bachelor of Surgery.

No one is admitted to the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* who has not been engaged in Medical and Surgical study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course of instruction in Practical Midwifery and have personally conducted at least 12 cases of labour.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Two of the five years of medical study must be spent in the University of Edinburgh. The remaining three years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teacher as may be recognised for the purpose by the University Court. Of the subjects of study—viz., Anatomy, Practical Anatomy, Chemistry, Practical Chemistry, Materia Medica, Physiology, Practical Physiology, Practice of Medicine, Surgery, Midwifery and Diseases of Women, Pathology, Practical Pathology, Physics, Botany, Zoology, Medical Jurisprudence, and Public Health—not less than one-half must be taken in the University of Edinburgh, which corresponds to the two years above referred to.

Women are admitted to graduation in medicine under the same conditions as men.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery is £34 13*s.*, and the proportion of this sum to be paid by a candidate at each division of the examination shall be as follows—viz.: For the First Division of the Examination (Botany, Zoology, Physics, and Chemistry), £9 9*s.*; for the Second Division (Anatomy and Physiology), £7 7*s.*; for the Third Division (Pathology and Materia Medica and Therapeutics), £6 6*s.*; and for the Final Division (Surgery and Clinical Surgery, Medicine and Clinical Medicine, Midwifery, Clinical Gynæcology, and Forensic Medicine and Public Health), £11 11*s.*

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted for approval of the Faculty. The fee to be paid for the degree of M.D. is £21, and the fee to be paid for the degree of Ch.M. is £21.

Post-Graduate Instruction.—Courses of instruction are given for the Degrees of B.Sc. and D.Sc. in Public Health and for the University Diplomas in Public Health, Tropical Medicine and Hygiene, and Psychiatry. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University. The University also takes part in the Courses given under the auspices of the Edinburgh Post-Graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars can be obtained from the Dean of the Medical Faculty.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES, Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that about 1000 students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards.

The practical classes and laboratories will open and the lectures commence on Oct. 14th.

In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school.

Special courses of instruction for dental students are also included in the curriculum of this school.

The minimum cost of the education in this School of Medicine for the Triple Qualification of Physician and Surgeon from the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, including the fees for the Joint Examinations, is about £170, payment of which is distributed over the period of study. There is no composition fee.

Post-graduate Courses are conducted in conjunction with the University.

Further particulars regarding the school, also its calendar (price 6*d.*) may be had on application to the Dean of the School, 11, Bristo-place, Edinburgh.

In connexion with the University and Royal Colleges Post-Graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

Clinical Instruction.—ROYAL INFIRMARY, Edinburgh.—This hospital has 921 beds and 42 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There are also large and complete Medico-Electrical and X Ray Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology. The fees for hospital attendance are as follows—viz.: Perpetual ticket, in one payment, £12; annual ticket, £6 6*s.*; six months, £4 4*s.*; three months, £2 2*s.*; monthly, £1 1*s.* Separate payments amounting to £12 12*s.* entitle the student to a life ticket. The appointments are as follows: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department are appointed by the pathologist.

Facilities are given in connexion with the Post-graduate Courses arranged by the Edinburgh University and the two Royal Colleges jointly.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—This hospital contains 120 beds, and is fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily in a building adjoining the hospital. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given from time to time throughout the year by the staff. Students may enter at any time. Post-graduate Courses of Lectures are held during the year. Full particulars can be obtained from the Registrar at the hospital.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for outdoor patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Patients whose diseases require operations or more than ordinary care are accommodated in the house. Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A post-graduate course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing in May, October and January, and continuing for six weeks. The next course commences on Oct. 14th, 1924. The class meets at 5 P.M. Tuesdays and Fridays, and the instruction, which is essentially practical, is supplemented by lantern demonstrations. Secretary: Mr. J. P. Watson, W.S., 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: M.B. and Ch.B. (always conjointly), M.D. and Ch.M.; B.Sc. in Public Health; D.Sc. in Public Health; B.Sc. in Pharmacy; and Ph.D. in the Faculty of Medicine. A Diploma in Public Health (D.P.H.) is also granted.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required after registration as a medical student in the books of the General Medical Council. The candidate must, during his curriculum, have attended a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine, and the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of

Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (Doctor of Medicine) and Ch.M. (Master of Surgery) are higher degrees in Medicine and Surgery respectively, and candidates (not under 24 years of age) who have previously obtained the double bachelorship may be admitted to either M.D. or Ch.M. on completing the after course prescribed, including an examination in Clinical Medicine for M.D. and an examination in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M.

The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject-matter of the thesis.

Fees.—The Fees for M.B. and Ch.B. are £34 13*s*. The class fee in each subject of the curriculum for M.B. and Ch.B. is £3 3*s*., £4 4*s*., or £6 6*s*., and the present fee for hospital attendance is £7. The fee for M.D. is £21, and for Ch.M. £21.

The great majority of the students take their hospital course at the Western, Royal, and Victoria Infirmary, and at the district hospitals of the Glasgow Parish Council, where clinical instruction is given by professors of the University and others. Clinical instruction on Fevers is given at Ruchill and Belvidere Hospitals, while special courses, largely of a practical nature and embracing work in Hospital or Asylum wards, are conducted by University Lecturers on the Ear, the Throat and Nose, Dermatology, Ophthalmology, Venereal Diseases, Tuberculosis, Insanity, and Electro-diagnosis and Therapeutics. Queen Margaret College, sometime conducted as a separate institution for the higher education of women, was made over to the University in 1892, and in it certain medical classes for women are conducted under University lecturers appointed by the University Court.

Post-graduate Medical Teaching.—Organised Post-graduate Medical Teaching is now available in Glasgow under the auspices of Glasgow Post-graduate Medical Association. This Association is composed of practically all the Teaching Institutions in Glasgow and the various teachers giving post-graduate instruction, and its business is managed by a Board elected periodically by them. The chairman of the Board is Principal Sir Donald MacAlister, and the vice-chairman Sir Hector C. Cameron. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from Dr. James Carslaw, Secretary, Post-Graduate Medical Association, University, Glasgow.

In this University Bursaries and Prizes to the annual amount of over £1000 are appropriated to students in the Medical Faculty, and there are also several Scholarships and Fellowships which may be held by medical students who have gone through the Arts course. A full list will be found in the University Calendar.

THE ANDERSON COLLEGE OF MEDICINE, Dumbarton-road, Glasgow, W.—Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Candidates for the Licence in Dental Surgery can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

The buildings are situated in Dumbarton-road, immediately to the west of the entrance to the Western Infirmary, and adjoining the University. Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students.

Women students are admitted on the same terms as men.

The Carnegie Trust extends its benefactions to students of the Anderson College of Medicine. Full particulars may be obtained from Sir W. S. McCormick, the Carnegie Trust Offices, Merchants' Hall, Edinburgh.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty, The Anderson College of Medicine, Glasgow, W. Communications relating to the Preliminary Examination in General Education to be addressed to Mr. George C. Pringle, M.A., Educational Institute Office, 47, Moray-place, Edinburgh. Communications relating to the Triple Qualification to be addressed to Mr. Walter Hurst, Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

The Winter Session will open on Monday, Oct. 13th, 1924.

ST. MUNGO'S COLLEGE AND GLASGOW ROYAL INFIRMARY.—The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust as regards Scottish birth or extraction, age (16 years), and Preliminary Examination, are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. The classes are open to male and female students equally. The minimum fees for all the lectures, including hospital attendance, necessary for candidates for the Diplomas of the English or Scotch Colleges of Physicians and Surgeons, amount to £120. Further particulars can be obtained from a syllabus which may be procured free on application to the Secretary of the Medical Faculty, 86, Castle-street, Glasgow.

QUEEN MARGARET COLLEGE (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curriculum, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. They have access to the University Museum and can borrow books from the University Library, besides having a library of reference in Queen Margaret College. The School of Medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. In July, 1894, for the first time in the history of any Scottish University, women students graduated in medicine in Glasgow University. Approximately 600 women have now taken the degree of M.B., C.M., or M.B., Ch.B. of the University of Glasgow and 33 the degree of M.D. The women students attend classes in the various University Buildings at Gilmore-hill. Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Excellent facilities for clinical work are given in the Royal, Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine; and by an ordinance of the Universities Commissioners women are admitted to certain University bursaries, scholar- ships, and fellowships. The Winter Session will open on Oct. 13th. New students of Medicine will be admitted in April, 1925. Applications for entrance at that date should be made before Feb. 1st, 1925.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. St. Mungo's College is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, 700 beds. There are special beds and wards for diseases of women, of the throat, nose, and ear, skin, venereal diseases, burns and septic cases. The wards are open to Women Students. At the Out-door Department the attendances in 1923 numbered over 200,000. In addition to the large medical and surgical departments there are departments for special diseases—viz., diseases of women, of the throat and nose, of the ear, of the eye, of the skin, and of the teeth. Five house physicians and 10 house surgeons, who board in the hospital free of charge, are appointed every six months. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Venereal Disease in the Male, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. For information regarding fees and other particulars, application should be made to the Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital adjoins the University of Glasgow. Number of beds upwards of 600. Special wards are set apart for Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electro-therapeutics. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological Department the course is both systematic and practical, also postgraduate courses, and extends through the winter and following summer; these are likewise recognised by the University for graduation. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. The fees are as follows:—For Infirmary Attendance, Dispensary, &c.: (*a*) For Perpetual Ticket, £12 12*s.*; (*b*) for Single Term Ticket, £1 11*s.* 6*d.* For Courses of Instruction: (*a*) Six Months or Two Terms, £5 5*s.*; (*b*) Three Months or One Term, £2 12*s.* 6*d.* A Clinical Laboratory has been opened, and students receive laboratory instruction from the lecturer on clinical methods. Secretary: J. Matheson Johnston, C.A., 87, Union-street.

A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics.

ROYAL HOSPITAL FOR SICK CHILDREN, Glasgow.—This institution, which was founded in 1882. consists of: (1) a hospital at Yorkhill containing 270 cots built on an elevated and central site close to the University and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888: and (3) a country branch at Drumchapel, Dumbartonshire, containing 30 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from in- infectious diseases. In 1923 there were 5853 patients treated, and there were 74,689 attendances of out-patients. There are one professorship and two lectureships in the University of Glasgow in connexion with the hospital, one professorship and one lectureship on the Medical Diseases of Infancy and Childhood, and one lectureship on Surgery and Orthopædics in Relation to Infancy and Childhood. The lectureships are held by the Visiting Physician, Dr. Leonard Findlay, and one of the Visiting Surgeons, Mr. Alex. MacLennan. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition special facilities are given for post-graduate study. Information with regard to clinical instruc- tion, lectures, demonstrations, post-graduate study, &c., may be obtained from the Med. Superintendent.

THE GLASGOW ROYAL MATERNITY AND WOMEN'S HOSPITAL, Rottenrow.—The new hospital, which was opened in 1908, is in point of size the largest of its kind in Britain and has accommodation for 108 patients. A Maternity and Child Welfare Centre has been established in connexion with the hospital, consisting of a complete In-door and Out-door Ante- natal Department and an Infant Consultation Clinic. In 1923 5026 normal cases and 2390 abnormal cases were treated by the hospital in the In-door and Out- door Departments. Secretary: Mr. William Guy, 146, Buchanan-street. Full particulars as to fees and accommodation may be obtained from the House Superintendent at the hospital.

ROYAL SAMARITAN HOSPITAL FOR WOMEN, Glasgow.—This hospital, founded in 1886, is the largest purely gynæcological hospital in Great Britain, possessing, as it does, over 90 beds, which will be increased to 160 when building extensions are completed. It offers excellent facilities for clinical instruction in the diseases peculiar to women, treating in the wards and in the out-patient department from 5000 to 6000 cases per annum. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for coordinating post-graduate medical teaching in all the hospitals. For further information application may be made at the Hospital, or to T. Mason Macquaker, M.A., B.L., Secretary, 149, St. Vincent-street, Glasgow.

GLASGOW LOCK HOSPITAL, 41, Rottenrow.—The hospital contains 83 beds. During 1923 494 patients were admitted to the wards; 20,731 visits were made by out-door patients at the dispensary. A Labour Ward has been added. Classes are held for the clinical instruction of medical students. These classes are now compulsory, and 174 students attended last year. There are also post-graduate classes held. A new lecture room and laboratory is being built. J. Neilson Gray, LL.B., secretary and treasurer, 65, Bath-street, Glasgow.

GLASGOW OPHTHALMIC INSTITUTION, 126, West Regent-street, and 131, Wellington-street (30 beds and six cots).—Clinical and systematic course of lectures for students during the winter and summer sessions.

In-patients, 855; out- or dispensary patients, 13,541; daily average of attendances, 142·4; total attendances, 39,575. Operations on Wednesdays and Saturdays. This institution is administered by the Royal Infirmary. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

Glasgow Eye Infirmary, Berkeley-street and Charlotte-street.—This institution, the largest of its kind in Scotland, was founded in 1824. The average number of new patients for the last ten years has been 25,714 and the total number of cases in 1923 was 56,138. The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Secretary and Acting Treasurer: Harold John Black, 88, West Regent-street, Glasgow. The medical session opens in October. Post-graduate Classes are being held.

Glasgow Hospital for Diseases of the Ear, Nose, and Throat, 27 and 28, Elmbank-crescent.—14 beds. New patients, 6374. Attendances at out-patient department 20,348. Admitted to in-door department 440. Clinical instruction is given in connexion with Dr. Connal's course on Diseases of the Ear at Anderson's College and Dr. Syme's course on Diseases of the Throat and Nose at the Western Medical School. Secretary: D. N. Mackay, 144, St. Vincent-street, Glasgow.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), a Diploma in Public Health, and Diploma in Dental Surgery (L.D.S.).

The Preliminary Examination includes (*a*) English, (*b*) Latin, (*c*) Elementary Mathematics, and (*d*) one of the following optional subjects: (α) Greek, (β) French, (γ) German, (δ) Italian, (ε) any other approved modern language. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities shall exempt from the Preliminary Examination. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science and the Final Examination for the Diploma of L.L.A.

Degree of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years after registering as a medical student. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz.: Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, or Institutes of Medicine, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Practical Chemistry, Physics (including the Dynamics of Solids, Liquids, and Gases, and the Rudiments of Sound, Heat, Light, and Electricity), Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons and is recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine, subject to certain provisions.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica and Pathology and Bacteriology and Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical). The combined fee for tuition and clinical tuition is £182, payable in five annual instalments. Additional fees are required for hospital ticket, midwifery cases, laboratory apparatus.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery shall be 33 guineas, and the proportion of this sum to be paid by a candidate at each division of the examination shall be regulated from time to time by the University Court. The fee to be paid for the degree of Doctor of Medicine shall be 20 guineas, and for the degree of Master of Surgery 20 guineas. The whole medical curriculum can be taken in University College, Dundee, or the first two years in United College, St. Andrews.

For further particulars and details as to scholarships and bursaries application should be made to Prof. Charteris, Dean of the Medical Faculty, University College, Dundee.

University College, Dundee.—This College is one of the constituent colleges of the University of St. Andrews. In the medical buildings there are spacious and well-equipped laboratories. The complete medical curriculum can be taken in Dundee. For classes, fees, &c., see under University of St. Andrews.

Royal Infirmary, Dundee.—The Infirmary contains 408 beds. In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electro-therapeusis, and Electro-cardiography. An extension providing for new X Ray and Massage Departments and for additional Operation Theatre accommodation is being constructed at a cost of £20,000. Clinical teaching is given to male and female Students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Boards of the United Kingdom. Nine Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. The fees for Hospital attendance are as follows: For Perpetual Ticket, £12, or if paid in instalments, £12 12*s.*; Ticket for 12 Months, £4 4*s.*; Ticket for 3 Months, £1 11*s.* 6*d.* Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Medicine (M.B.), and Bachelor of Surgery (Ch.B.). The Degree of Doctor of Philosophy (Ph.D.) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Before commencing his medical studies each student must comply with the following regulations: (1) Every Candidate desiring admission to the Faculty of Medicine must be in possession of the necessary "Certificate of Fitness" issued and attested by the Scottish Universities Entrance Board, 81, North-street, St. Andrews. Forms on which to make application for this Certificate may be obtained from the Secretary to the University of Aberdeen. From and after Jan. 1st, 1921, the Regulations contained in the Ordinances for Degrees in Medicine are revoked, and the following General Regulation made by the Entrance Board is substituted therefor, namely: "That (*a*) the Group Certificates of the Scottish Education Department, or (*b*) the evidence of satisfactory completion in Schools in Scotland of a curriculum of Secondary Education, as attested by the said Group Certificates or otherwise, or (*c*) the Leaving or other Certificates accepted as qualifying for admission to the Universities in the case of applicants for admission from outside Scotland, which shall be deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Medicine, shall be the same as those which, under the Regulations for the time being in force, are deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Arts or, alternatively, in the Faculty of Science, for Degrees in Pure Science."

Candidates, therefore, before entering on the curriculum for the Degree must: (1) have passed (*a*) the Arts Preliminary Examination, or (*b*) the Science Preliminary Examination, or (2) hold a qualification recognised as exempting from such examination. (3) Have attained the age of 17 years. (4) That they have passed the Pre-registration Examination in Physics and Chemistry.

The following regulations for Pre-registration Courses in Physics and Chemistry have been made by the University of Aberdeen:—

1. Pre-registration Courses in Physics and in Chemistry will be held in the Winter Term and in the Summer Term. The fee for each course is £2 2*s.*
2. The Senatus Academicus has power to grant exemption from attendance on these courses of instruction to students who have completed courses of instruction in Physics or Chemistry in a Secondary School, Technical or University College, Medical School or University, provided that the courses include practical work.
3. Pre-registration Examinations will be held in Marischal College at the end of the Summer Term, immediately before the commencement and at the end of the Winter Term, and at the end of the Spring Term, or at such other times as the University Court, after consultation with the Senatus Academicus, may determine. The Examination Fee is 10*s.* 6*d.* for each subject.
4. The Senatus has power to grant exemption from the Pre-registration Examination to candidates: (i.) who have passed an Examination in Physics and Chemistry for a Degree in Arts, Science, or Medicine at any University in the United Kingdom, or any other University specially recognised for the purpose by the University Court, or (ii.) who have passed an Examination in these subjects which has been previously specially recognised by the University Court as equivalent to the Examination carried out by the University of Aberdeen.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital; they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

The cost, including Matriculation, Class, Degree, and Hospital Fees, for the whole curriculum leading to the Degrees of M.B. and Ch.B. is approximately £240.

Besides the Royal Infirmary, students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, and Lying-in and Vaccine Institutions, Royal Lunatic Asylum, Ophthalmic Institutions, &c.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis must be presented for approval. The fee is £10 10*s.*

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Application for further information should be addressed to the Secretary of the Medical Faculty.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £30 per annum in value, most of them being tenable for three years. Scholarships: five Post-Graduate Scholarships, value £36 to £160 per annum. Prizes and Medals: 13 Gold Medals and Prizes for proficiency in special departments, &c.

Clinical Instruction is given in the Aberdeen Royal Infirmary (270 beds) by the physicians and surgeons on the staff.

ABERDEEN ROYAL MENTAL HOSPITAL.—Contains, with hospital attached to main institution and agricultural branch, about 950 beds. Clinical instruction is given to students during three months in summer. Clerk and Treasurer, Mr. A. Scott Finnie, 343, Union-street, Aberdeen.

In-patients, 855; out- or dispensary patients, 13,541; daily average of attendances, 142·4; total attendances, 39,575. Operations on Wednesdays and Saturdays. This institution is administered by the Royal Infirmary. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

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Royal Infirmary, Dundee.—The Infirmary contains 408 beds. In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), for Diseases of Women, of Children, of the Eye, of the Ear, Nose and Throat, and of the Skin; and for Clinical Pathology, Radiology, Electro-therapeusis, and Electro-cardiography. An extension providing for new X Ray and Massage Departments and for additional Operation Theatre accommodation is being constructed at a cost of £20,000. Clinical teaching is given to male and female Students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The Royal College of Surgeons of Edinburgh grants a diploma of Fellowship after examination to the holders of the surgical degrees of diplomas of such British examining bodies, as well as of the holders of such surgical degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire as are recognised by the College.

The Fellowship.—Candidates for the examination must be 25 years of age and must have been engaged in practice for at least two years. The examination is of a practical nature, partly written and partly vivâ voce, and must include surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. The fee to be paid on entering for examination for Fellowship is £45, £10 of which is remitted to those who already hold the Licentiateship of the College. Candidates rejected at the examination obtain repayment of fee less £10 retained for examination expenses. One month's notice of intention to appear for examination must be given by the candidate to Mr. D. L. Eadie, 49, Lauriston-place, Edinburgh, clerk to the College, together with credentials signed by two Fellows of the College, one of whom must be a resident in Edinburgh, otherwise a special application, with six testimonials, must be made to the President and the Council of the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Like the preceding corporations, the Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held as separate qualifications.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate of his intention to present himself to Mr. Walter Hurst, the Faculty Hall, 242, St. Vincent-street, Glasgow. The fee for the Fellowship is £30, £10 of which sum are returned to any successful candidate who already holds the Licence of the Faculty. An additional sum of £20 is required in the case of candidates resident within seven miles of Glasgow. In certain circumstances Fellows may be elected as a mark of distinction.

Licence.—The Licence of the Royal Faculty is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery. The fee is 15 guineas.

SCOTTISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

The hospitals which are recognised by the Scottish Conjoint Board as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities. In addition the Scottish Boards recognise all the places which are recognised by the English Conjoint Board (see p. 432) and the Irish Conjoint Board (see p. 453).

III.—IRELAND.

THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—In order to join the School of Physic students pass a matriculation examination. University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council. The winter courses begin on Oct. 1st.

Pre-registration Examination in Elementary Physics and Chemistry.—Before beginning the five years' Medical curriculum students must pass an examination in elementary Physics and Chemistry. This examination is held at the end of September, in January, in March and in June. Courses in preparation for it may be taken in the School of Physic. On passing this examination Medical students should register as such with the General Medical Council.

Degrees in Medicine (M.B.), Surgery (B.Ch.), and Midwifery (B.A.O.).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of registration. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Lectures—Botany, Zoology, Physics and Practical Physics; Systematic, Descriptive and Applied Anatomy; Chemistry and Practical Chemistry; Histology, Physiology, Practical and Applied Physiology; Practice of Medicine; Midwifery and Gynæcology, Pathology and Bacteriology; Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Surgery and Operative Surgery; (2) three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry; and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica and Therapeutics, Hygiene and Jurisprudence, Pathology and Bacteriology; and Part II., Medicine, including Clinical Medicine and Mental Diseases; Surgery, including Operative and Ophthalmic Surgery; Midwifery and Gynæcology. Part I. may be passed in the fourth year and Part II. completed at the end of the fifth year.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also read and discuss a thesis before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

SCOTTISH CONJOINT BOARD.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three Bodies.

The three Bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery. Copies of the Regulations for the Single Licence of any of the Bodies may be had on application to the respective secretaries.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, three months; Chemistry, six months; Practical or Analytical Chemistry, three months: Anatomy, during at least six months; Practical Anatomy, twelve months; Physiology, six months; Practical Physiology, three months; Materia Medica, three months; Pathology (including Practical Pathology), nine months; Practice of Medicine, six months; Clinical Medicine, nine months; Principles and Practice of Surgery, six months; Clinical Surgery, nine months; Midwifery, three months; Gynæcology, one course of not less than 13 meetings; Diseases of Children, one course of not less than 13 meetings; Medical Jurisprudence and Public Health, three months. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of a class of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than six months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for six months the practice of a public dispensary especially recognised by any of the above authorities, or the out-patient practice of a recognised general hospital or act for six months as pupil to a registered practitioner who either holds such a public appointment, or has such opportunities of imparting practical knowledge as shall be satisfactory to the coöperating authorities; this attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: Diseases and Injuries of the Eye, three months; Insanity, three months; Infectious Diseases, three months: Gynæcology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Physics, Chemistry, and Elementary Biology.

Second Examination includes Anatomy and Physiology and Histology; and candidates may be admitted to this examination at the end of the second year of medical study.

Third Examination includes Pathology and Materia Medica with Pharmacology.

Final Examination.—The Final examination shall not be taken earlier than the end of the fifth year of study and shall embrace the following subjects:—Medicine, including Therapeutics, Medical Anatomy, and Clinical Medicine; Surgery, including Surgical Anatomy, Clinical Surgery, and Diseases and Injuries of the Eye; Midwifery and Diseases of Women; and, if not passed previously, Medical Jurisprudence and Public Health, but it is optional to candidates who have passed the Third Examination to be admitted to the subject of Medical Jurisprudence and Public Health on lodging certificates of having attended the necessary course in that subject at any time; but the subjects of Medicine, Surgery, and Midwifery shall be taken together at any time after the end of the fifth Winter Session, provided that a period of 24 months has elapsed since passing the Second Examination. All candidates shall be subjected, in addition to the written and oral examinations, to clinical examinations in Medicine and Surgery, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope, Examination of the Urine and Urinary Deposits, Surgical Appliances, Bandages, Surface Markings, &c. The fees payable for the Final Examination shall be—for the whole examination, £15, for re-entry after rejection, £5, and for the subjects of Medical Jurisprudence and Public Health when taken separately, £5, with £3 for re-entry in that subject.

There are four periods of examination annually: During the ensuing period thrice in Edinburgh and once in Glasgow, in 1924–25. The Registrar in Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom further particulars concerning fees can be obtained.

For students registered with the General Medical Council after Jan. 1st, 1923, more extensive Regulations are in force, and candidates applying for Regulations should state date of registration.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: THE MEMBERSHIP AND FELLOWSHIP.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship*.

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence. The fee for the Membership is £36 15*s.*, 15 guineas of which will be returned to any successful candidate who was already a Licentiate of the College at the time of qualifying for the Membership.

Fellowship.—The Fellows are selected from the ranks of the *Members.* The fee is £64 18*s.*

ROYAL COLLEGE OF SURGEONS OF EDINBURGH: THE FELLOWSHIP.

The Royal College of Surgeons of Edinburgh also admits to the examination for its Single Licence any various athletic clubs, the last of these holding a public meeting once in each year in the Mardyke grounds.

All students who have been admitted as matriculated students are required to attend before the President and sign the Roll of Matriculated Students. Students who are candidates for degrees in the National University of Ireland must have passed the Matriculation Examination of that University or other recognised examination, and medical students must have passed a preliminary examination recognised by the General Medical Council. For information as to the conditions and courses of the Matriculation Examination application may be made to the Registrar, National University, Dublin.

Admission of Medical Students.—Students in the Faculty of Medicine who have passed the First Professional Examination of the Conjoint Examinations of the Royal College of Physicians and the Royal College of Surgeons in Ireland, or of the Royal College of Physicians and Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Physicians, London, and Royal College of Surgeons, England, may be admitted to the rank of second-year students on making application to the Council and submitting a certificate of having passed the examination. Similarly, students who have passed the Second Professional Examination of the same Colleges may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may be admitted to the rank of fourth-year students.

Residence of Students.—There is no accommodation for the residence of students within the College, but students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, a list of which can be obtained from the Secretary. All students are required to register their addresses each session in the book kept for that purpose in the hall porter's office, and to notify immediately to the Registrar any change of address during the session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Infirmary, Cork North Charitable Infirmary, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, the Cork Maternity, the Cork Fever Hospital, the Cork District Hospital, and the Cork Ear, Eye, and Throat Hospital.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, Professor A. E. Moore.

*South Charitable Infirmary and County of Cork General Hospital** (100 beds).—Clinical instruction is given daily in the wards. Special instruction on Diseases of Women and Children will be given in the special wards for such cases. Fee for nine months, £12 12*s.*; for six months, £8 8*s.*; for three months, £4 4*s.* Two resident pupils will be appointed by competitive examination.

Cork North Charitable Infirmary and County and City of Cork General Hospital (112 beds).—Clinical instruction is given daily in the wards by the physicians and surgeons. Special instruction is given to Junior students on two days weekly. Fee for 12 or nine months, £12; for six months, £8; and for three months, £4. Two resident pupils are appointed quarterly by the medical staff. All resident pupils are required to be registered pupils of the hospital. There is a special department for treatment of the eye, ear, throat, and nose, and a special dental department. The hospital contains a fully equipped Pathological Department, and a large and extensive X ray Department has recently been added.

Mercy Hospital.—Clinical hospital recognised by the General Nursing Council for Ireland. This hospital contains 130 beds for medical and surgical cases. There is also a daily extern for medical and surgical cases, as well as for diseases of the eye, ear, and throat. Extern medical and surgical, also eye, ear, and throat attendances for 1923, 31.952; intern patients, 1499. Daily average, 216·6. Two resident students. Honorary Secretary to the Staff: Dr. D. J. O'Connor. Special apartments for nurses and nuns under training. Large children's ward cannot be worked for want of funds.

Cork Mental Hospital (Psychological Medicine).—A course of Clinical Lectures on Mental Diseases and Allied Neuroses will be delivered by the Resident Medical Superintendent in the Cork Mental Hospital as soon as possible after the opening of the Trinity Term. The lectures will comprise: Normal Psychology; Psychology of the Insane; Psychoses, Statistics, Classification. Ætiology, Symptomatology, Diagnosis, Prognosis, Pathology and Treatment, Psychoneuroses; Neuroses. The course will be illustrated by typical cases of the various forms of Mental Affections. For further particulars apply to Dr. Owen F. McCarthy, Resident Medical Superintendent.

Victoria Hospital (Incorporated) (Cork).—There are 75 beds. Clinical instruction on Diseases Peculiar to Children is given. The extern department is open daily at 9.30.

County and City of Cork Lying-in Hospital (Erinville, Western-road; founded 1798).*—This hospital contains 22 beds, an Extern Midwifery Department, Gynæcological Department, Extern Department for Women, and Child Welfare Centre. Training Centre for Midwives, preparing for C.M.B. examinations. Fee for six months' attendance, including clinical lectures, £5 5*s.* For further particulars apply to Lucy E. Smith, M.D., secretary to staff.

Cork Maternity (Batchelor's Quay).*—Three resident pupils are taken into the Maternity. Poor women are attended at their own homes and there are 8 intern beds. A Child Welfare Centre and Clinic was established in 1919. Clinical lectures are delivered during the session. There is an extern department for the treatment of women's and children's diseases. Fee for attendance at clinical lectures and certificate, £5 5*s.* Honorary secretary to staff, Dr. Henry Corby.

*Cork Fever Hospital.**—Upwards of 500 cases of various forms of fever and zymotic disease are treated yearly in this hospital. The Resident Medical Officer gives instruction in Practical Pharmacy, a certificate of which is necessary for the National University and Colleges of Physicians and Surgeons of Edinburgh.

Cork District Hospital (Douglas-road; 1200 beds).—This hospital includes special buildings for fever and other infectious diseases (100 beds); for children's diseases (100 beds); and a Lock hospital, the only one in the South of Ireland (80 beds). It affords an extensive field for the study of all classes of diseases, acute and chronic, including special departments for gynæcology and diseases of the skin and nervous system. The physicians and surgeons visit the hospitals every morning at 10 o'clock. Lectures and clinical instruction are given daily in the wards by the physicians and surgeons. Further particulars may be obtained from Dr. D. Morrissy, 88, South Mall, Cork, honorary secretary, medical staff.

Cork Eye, Ear, and Throat Hospital (Western-road).*—This hospital is open to students attending the

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* No returns.

* No returns.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital or other recognised institution, a six months' course in Trinity College, and then pass a special examination. Three months of each of the courses may be taken concurrently.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Clinical Instruction.—The hospital facilities for clinical instruction available in Dublin will be described below.

NATIONAL UNIVERSITY OF IRELAND.*

Matriculation.—All students intending to proceed to the medical degree of the University of Ireland must pass a matriculation examination, the examination taking place in June and September in Dublin and at certain local centres. All students must pass in five subjects (three of which must be Irish, English, and mathematics). All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—1. Irish. 2. Latin or Greek. 3. French, German, Italian, Spanish, Portuguese, Welsh, or any other modern language approved by the Senate. 4. English. 5. Mathematics. 6. Latin, Greek, French, German, Welsh, Spanish, Italian, Portuguese, or any other modern language approved by the Senate, History and Geography (*as a composite subject*), Natural Philosophy, or Physics as an alternative, Chemistry, Botany, and for women candidates only, Physiology and Hygiene. Candidates who under the regulations are exempted from the necessity of presenting Irish as one of their subjects, may present as their fifth subject either a second language or a second science subject. Students entering for degrees in Medicine or Dentistry, if already registered by the General Medical Council, may be accepted as matriculated students of the Faculty of Medicine on passing the matriculation examination in any faculty of the University.

The medical degrees granted are:—

M.B., B.Ch., and B.A.O.; and M.D., M.Ch., and M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—The University and the College were created by the Irish University Act, 1908, and by Charters issued in December, 1908. Former students of the Cecilia-street School of Medicine who graduated in the Royal University may become graduate members of the new College. The constitution of the College, like that of the Constituent Colleges of Cork and Galway, provides for a governing body, an academic council consisting of professors and coöpted lecturers, a body of graduate members, and a body of student members matriculated in the University. The first professors and lecturers were appointed by the Dublin Commissioners Irish Universities Act, 1908.

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland.

Universities Examinations in Medicine.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination includes Pathology, Medical Jurisprudence and Hygiene, and Materia Medica.

Degrees of M.B., B.Ch., and B.A.O.—The Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year when the curriculum has been completed. The course of study is as follows:—First year.—Winter: Anatomy and Practical Anatomy (required for the Second Examination), Applied Chemistry, Materia Medica and Pharmacology, Applied Anatomy and Physiology, Practical and Applied Physics (with Laboratory Course). Summer: In addition, Applied Biology, Anatomy, and Physiology. Second Year.—Winter: Anatomy, Practical Anatomy, Physiology, and Practical Physiology (physical and chemical). Summer: Anatomy, Practical Anatomy, Physiology, and Practical Histology. Third year.—Winter: Pathology, Surgery, Materia Medica and Pharmacology, Applied Anatomy and Physiology, and Pharmacy. Summer: Materia Medica and Therapeutics, and Practical Pathology. Candidates are also required to attend a General Hospital for nine months (winter and summer). Fourth year, or fourth and fifth years.—Medicine, Medical Jurisprudence and Hygiene, Midwifery and Gynæcology, Operative Surgery, Therapeutics, Applied Anatomy, and Ophthalmology and Otology. Candidates are also required to attend a General Hospital for nine months (winter and summer), and to take instruction in Vaccination, and three months Fever Hospital. Fifth year.—If the Academic (Collegiate) Courses are taken as above, the Courses of the fifth year will be the following: Hospital Attendance, General Hospital, nine months; Clinical Ophthalmology and Otology, three months; Practical Midwifery and Gynæcology, six months; Mental Diseases, to be attended at a Lunatic Asylum, three months. (*Note.*—Practical Midwifery and Gynæcology may be taken in the fourth year after the Systematic Course of Midwifery, but it must not be taken concurrently with the period of attendance at Fever Hospital.) Hospital attendance on Diseases of the Skin, Children's Diseases, Diseases of the Ear, Throat and Nose, Venereal Diseases, and instruction in Radiology are also included in the new curriculum. The degree of M.D. may be obtained either by examination or on published work.

Fees.—The fees for Courses may be obtained on application to the Registrar for the College publications.

Information concerning these, and the numerous scholarships and exhibitions of the College can be obtained from the Dean of the Faculty, Prof. E. P. McLoughlin.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—The building is provided with a very large, well-ventilated dissecting room supplied with electric light, with physiological, toxicological, pathological and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are well-appointed physical, chemical, and biological laboratories, and a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs, the last of these holding a public meeting once in each year in the Mardyke grounds.

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Cork Maternity (Batchelor's Quay).*—Three resident pupils are taken into the Maternity. Poor women are attended at their own homes and there are 8 intern beds. A Child Welfare Centre and Clinic was established in 1919. Clinical lectures are delivered during the session. There is an extern department for the treatment of women's and children's diseases. Fee for attendance at clinical lectures and certificate, £5 5*s.* Honorary secretary to staff, Dr. Henry Corby.

*Cork Fever Hospital.**—Upwards of 500 cases of various forms of fever and zymotic disease are treated yearly in this hospital. The Resident Medical Officer gives instruction in Practical Pharmacy, a certificate of which is necessary for the National University and Colleges of Physicians and Surgeons of Edinburgh.

Cork District Hospital (Douglas-road; 1200 beds).—This hospital includes special buildings for fever and other infectious diseases (100 beds); for children's diseases (100 beds); and a Lock hospital, the only one in the South of Ireland (80 beds). It affords an extensive field for the study of all classes of diseases, acute and chronic, including special departments for gynæcology and diseases of the skin and nervous system. The physicians and surgeons visit the hospitals every morning at 10 o'clock. Lectures and clinical instruction are given daily in the wards by the physicians and surgeons. Further particulars may be obtained from Dr. D. Morrissy, 88, South Mall, Cork, honorary secretary, medical staff.

Cork Eye, Ear, and Throat Hospital (Western-road).*—This hospital is open to students attending the

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* No returns.

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University College and others. Certificates of attendance for three or six months can be obtained. The hospital contains 35 beds. Over 3000 cases are treated during the year. A course of lectures is delivered during the session; also a post-graduate course of instruction. For further information apply to Dr. Arthur Sandford, Eye, Ear and Throat Hospital.

University College, Galway: School of Medicine.—The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, value £20 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value £20 each, are reserved for Medical Students. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Hospital and in the Galway Union and Fever Hospitals, containing on an average 200 patients.

*Galway Union and Fever Hospitals** (150 beds).—Clinical instruction is given in these hospitals to the Medical Students of University College, Galway. The regulations for Scholarships tenable in the College, and the regulations for degrees and for courses can be obtained from Messrs. O'Gorman and Co., Galway.

Central Hospital, Galway, Prospect Hill Branch (62 beds).—Founded by Act of Parliament.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.). The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine by the General Council of Medical Education and Registration of the United Kingdom; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission as a matriculated student of the University shall pass such Matriculation Examination or fulfil such other test of fitness as may be prescribed by the Senate, which may prescribe the conditions under which students who have passed the Matriculation or Entrance Examination of any other University or College approved for that purpose (or who have fulfilled such other test of fitness as may be prescribed) may be exempted from passing the Matriculation Examination of the University. For information as to Scholarships and Prizes inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations known as the First, Second, Third, and Fourth Medical Examinations respectively.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the First Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject thereof.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The Musgrave Pathological Laboratory. —In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, the diagnosis of cases of infectious diseases, &c. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

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Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum.

Royal Victoria Hospital, Belfast (350 beds).—Students eligible for McGrath, McQuitty, Malcolm, and Coulter Scholarships aggregate annual value £170. Ten House Surgeons and House Physicians. 36 resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students. Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electro-cardiography, Dentistry.

Mater Infirmorum Hospital (220 beds).

Belfast Infirmary and Hospital (1600 beds).—Clinical courses are given biennially, and a course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application, as to classes, to Dr. McLiesh. Certificate of vaccination class recognised by Local Government Board. A new department for Cancer with 32 beds has been opened.

Belfast Hospital for Sick Children, Queen-street.—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards (which contain 45 beds), and in the Out-patient Department, which is largely attended, for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. A Gold Medal is offered for competition at the close of the session. Fee for the session—2 guineas. For re-attendance—1 guinea. Hon. Secretary to the Medical Staff, Dr. Rowland Hill

Maternity Hospital, Townsend-street, Belfast.*—25 beds in constant occupation, and exclusively devoted to Midwifery and Ante-natal conditions. There is also a large district. Students are welcomed, and clinical lectures are delivered daily by a member of the Staff. There is also a large Ante-Natal Department where clinical instruction is given twice weekly. The Hon. Secretary of the Medical Staff is H. L. Hardy Greer, F.R.C.S.

Ulster Hospital for Children and Women, Templemore-avenue, Belfast (52 beds).—Clinical instruction to students in Diseases of Children, Gynæcology, and Obstetrics. Special departments: Radiology and Eye, Ear, and Throat. Gold Medal awarded annually. One House Surgeon appointed from students of hospital.

Benn Ulster Eye, Ear and Throat Hospital, Incorporated, Clifton-street, Belfast (30 beds).

Belfast Ophthalmic Hospital, Great Victoria-street (30 beds).—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (330 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-Graduate (D.P.H.) Classes are also held. Lecturer: A. Gardner Robb, M.B., D.P.H.

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The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years. There is a fee of £35 in addition to a stamp duty of £25.

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ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Licence in Surgery.—A candidate whose name is entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Conjoint Board of the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland, preceded by the passing of an Examination in Arts recognised by the General Medical Council, may, at the discretion of the Council, be admitted to the Examination.

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University College and others. Certificates of attendance for three or six months can be obtained. The hospital contains 35 beds. Over 3000 cases are treated during the year. A course of lectures is delivered during the session; also a post-graduate course of instruction. For further information apply to Dr. Arthur Sandford, Eye, Ear and Throat Hospital.

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The Membership.—Examinations for Membership are held in February, June, and November. The fee for the examination is £21 to Licentiates of the College, or £36 15s. to non-Licentiates.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years. There is a fee of £35 in addition to a stamp duty of £25.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

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The Licence in Surgery.—A candidate whose name is entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Conjoint Board of the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland, preceded by the passing of an Examination in Arts recognised by the General Medical Council, may, at the discretion of the Council, be admitted to the Examination.

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Candidates are examined in Surgery, Clinical Surgery, Operative Surgery on the subject, Surgical Appliances, and Ophthalmic Surgery.

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars as to fees and conditions of examination can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

This body requires of candidates the passage either of its own preliminary examination in the subjects of general education or proof that the candidate has passed one of the tests accepted by the General Medical Council as well as passing in the Pre-Registration Examinations in Chemistry and Physics and Biology.

Professional Examinations.—There are three professional examinations, the first of which cannot be passed earlier than the end of the second winter session, nor the final before the conclusion of full five years of medical study. Before being admitted to any of them the candidate must show that he has studied the different subjects in practice and theory for the requisite periods, certificates to this effect being accepted from the authorities of most of the recognised medical schools at home and abroad. The first examination deals with (*a*) Anatomy, and (*b*) Physiology and Histology. The second examination deals with (*a*) Pathology, (*b*) Materia Medica, Pharmacy, and Therapeutics and Ophthalmology, and may be taken separately.

Final Examination.—This is divided into three divisions, which cannot be completed until at least five years have passed in medical studies other than those for the Pre-Registration Examinations, and five years at least since the beginning of the curriculum. The divisions are (*a*) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (*b*) Surgery, including Operative Surgery; (*c*) Midwifery, including Diseases of Women and Newborn Children, and the Theory and Practice of Vaccination.

Fees.—Preliminary Examination, £2 2*s.*; Re-examination, £2 2*s.* Pre-Registration Examination, £3 3*s.* Re-examination in Chemistry, £2 2*s*; in Physics, £1 1*s.* First Professional Examination, £15 15*s.*; Second, £15 15*s.*; Final, £6 6*s.* Re-examination fee is £2 2*s.* for each division.

Diploma in Psychological Medicine.—There are two examinations in connexion with this Diploma: Part I. consists of (*a*) Anatomy and Physiology of the Nervous System; (*b*) Psychology. Part II.: (*a*) Neurology, including Clinical and Pathological Neurology; (*b*) Psychological Medicine, including its legal relationships.

Fees.—£3 3*s.* for each part.

Further information can be obtained from Mr. Alfred Miller, Secretary of the Committee of Management, Royal College of Surgeons, St. Stephen's Green, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND (SCHOOLS OF SURGERY).—The schools of surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Barker Prize, £26 5*s.*; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.*

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Apothecaries' Hall of Ireland entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence. There are three professional examinations, the total fees for which amount to £26 5*s.* 6*d.* Women are eligible for the diploma.

There are four examinations—primary, intermediate, Parts I. and II., and final. They are held three times a year, in March, June and December. The primary examination comprises biology, physics, theoretical and practical chemistry (with an examination at the bench). Candidates holding a Pharmaceutical licence are exempt from this subject. Intermediate, Part I., Anatomy and Physiology. Intermediate, Part II., Pathology, Medical Jurisprudence, and Materia Medica and Pharmacy. The intermediate examination comprises anatomy of the whole body (including practical dissections), physiology, practical histology, and materia medica. The final examination comprises medicine, surgery, and midwifery.

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied on application to the Registrar at 95, Merrion-square, Dublin.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.[1]

SIR PATRICK DUN'S HOSPITAL, Grand Canal-street, Dublin.*—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Ten Resident Pupils are appointed every four months. Six surgical Dressers and six Clinical Clerks are appointed each month. There are facilities for women students.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

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* No returns.

[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

Fees.—Winter and summer session, £12 12*s.*; winter session (six months), £8 8*s.*; and summer session (three months), £5 5*s.* Special certificate in anæsthetics, £1 1*s.* The practice of this hospital is open to all students, and the certificates are recognised by Dublin University, the National University and Royal Colleges of Surgeons of England, Ireland, and Scotland.

The Hospital is an official "Treatment Centre" for venereal diseases.

Further information will be supplied by the Hon. Secretary to the Medical Board.

Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases Peculiar to Women, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. The practice of this hospital is one of the largest in Ireland. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Lady medical students can reside in the hospital. The residents' quarters are comfortable. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Fees: Extern pupils for full course of six months, £8 8*s.*; three months, £4 4*s.* Intern pupils, one month, £4 4*s.*; each consecutive month, £3 3*s.*; six months, £18 18*s.* Registration fee, in advance, 10*s.* 6*d.* Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

Adelaide Hospital, Peter-street, Dublin.—Fee for nine months' hospital attendance, £12 12*s.*; six months, £8 8*s.* Summer, three months, £5 5*s.*[1] Two resident surgeons are elected half-yearly and four or more resident pupils every four months. At the termination of the session prizes in Clinical Medicine, in Surgery, in Gynæcology, and in Dermatology will be awarded.

Hudson Scholarship.—In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10, together with a silver medal, will be awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from Dr. L. G. Gunn.

Jervis-street Hospital, Dublin.—Founded 1718; rebuilt 1886. 130 beds. A new operation theatre (1923) has been completed and contains all modern requirements.

Mater Misericordiæ Hospital, Dublin. (Under the care of the Sisters of Mercy.)—This Hospital was founded in 1861 by the Sisters of Mercy. It is the largest in Ireland, containing 382 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction will be given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery will be taught in the Special Wards and in the Dispensary. Surgical operations will be performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents; a fully-equipped Biochemical Laboratory, a modern Electro-Massage Department, and Electro-cardiograph room. Instruction will be given on Pathology and Bacteriology. Three House Physicians, eight House Surgeons, and 27 resident pupils will be elected annually. Dressers and Clinical Clerks will also be appointed, and certificates will be given to those who perform their duties to the satisfaction of the staff. Leonard Prizes will be offered for competition annually. For further particulars see prospectus. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases; also a Training School and a Home for Trained Nurses in connexion with the Hospital. Trained and experienced Nurses who have passed a qualifying examination in nursing can be obtained on application to the Lady Superior, Mater Misericordiæ Hospital.

Terms of attendance.—Nine months, £12 12*s.*; six winter months, £8 8*s.*; three summer months, £5 5*s.* Entries can be made with any of the physicians or surgeons, or with the Registrar, Dr. John O'Donnell, 3, Merrion-square. A prospectus containing in detail the arrangements for Clinical Instruction, Prizes, &c., may be obtained from the Secretary, Medical Board, Mr. H. Barniville, 9, Merrion-square.

Meath Hospital and County Dublin Infirmary. This hospital was founded in 1753 and now contains 150 beds available for clinical teaching. A building containing 40 beds for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months, and House Surgeons and Clinical Assistants are elected annually. Apply to Hon. Secretary and Treasurer of the Medical Board.

Mercer's Hospital.—This hospital, founded in 1734, is situated in the centre of Dublin, in the immediate vicinity of the Schools of Surgery of the Royal College of Surgeons, the Catholic University School of Medicine, and within five minutes' walk of Trinity College. It contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the posts of Resident Pupil, &c. There is a large dispensary for out-patients and a modern X ray department. An electro-cardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements.

Appointments.—A House Surgeon is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from amongst the most deserving members of the class.

Fees.—Winter, six months, £8 8*s.*; Summer, three months, £5 5*s.*; nine months, £12 12*s.*

For further particulars apply to Dr. Bethel Solomons, Hon. Sec., Medical Board, 42, Fitzwilliam-square, Dublin.

National Maternity Hospital, Holles-street, Dublin.—Established 1894. The hospital consists of an Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children. About 1035 cases are admitted and over 300 operations are performed annually. Every facility is given for the carrying out of practical work. Post-graduate and special courses are arranged for at any time. Certificates of attendance at this hospital are recognised by all the licensing bodies. Terms.—Intern Pupils: Six months, 16 guineas; three months, 9 guineas; two months, 6 guineas; one month, 3 guineas. Extern Pupils: Certified Courses (three months), 6 guineas; Post-graduate Courses by special arrangement. Clinical Lectures are given daily and Oral Lectures four times per week. During the past year over 50 Post-graduate students were admitted. The L.M. Diploma is given by special examination on arrangement with the Masters. Further particulars can be obtained from the Masters: Sir Andrew Horne, 94, Merrion-square, Dublin; Dr. Patrick McArdle, 27, Merrion-square; or from the Secretary, Holles-street, Dublin.

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[1] Special Lectures in Dermatology are given weekly; also practical demonstrations on the treatment of fractures from time to time.

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* No returns.

WE take this opportunity of thanking the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

PRISON MEDICAL SERVICE.

CANDIDATES for the Prison Medical Service are approved by the Secretary of State for the Home Department on the recommendation of the Prison Commissioners. Preference is always given to candidates who have experience of lunacy. Application for employment may be made on a special form, which can be obtained from the Secretary, Prison Commission, Home Office, London, S.W. 1. In the smaller prisons the medical officership is part-time, and is usually filled by practitioners in the locality, preference being given to those who have special experience of lunacy. In the large prisons the medical staff must devote their whole time to the Service. In the case of whole-time service, the appointment is in the first instance to the post of Medical Officer, Class II., and from the seniors of this rank the Medical Officers, Class I., are selected as vacancies occur. The pay of the whole-time prison medical staff is as follows: Medical Officer, Class II., £350, rising by annual increments of £20 to £600, making the pay at present with bonus £504 14*s*. to £801 11*s*.; Medical Officer, Class I., £650, rising by annual increments of £25 to £800, plus bonus, making the pay £864 to £1023 9*s*. Unfurnished quarters are provided or an allowance in lieu is made. There are 12 full-time medical officers of Class I. and 14 Class II., and 26 part-time medical officers. The number of vacancies is never large and promotion is slow. In the case of a part-time medical officer, the population of the prison is the basis of fixing the salary, unless there are some special features justifying special consideration. A committee was recently set up to inquire into the emoluments of prison officers, including medical officers, and the pay is in accordance with its recommendations.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 16TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 42; scarlet fever, 1433; diphtheria, 630; enteric fever, 91; pneumonia, 397; puerperal fever, 41; cerebro-spinal fever, 8; acute poliomyelitis, 29; encephalitis lethargica, 70; typhus fever, 2; trench fever, 1; dysentery, 2; ophthalmia neonatorum, 124. No cases of cholera or plague were notified during the week. The cases of typhus were notified from the county borough of St. Helens.

Deaths.—In the aggregate of great towns, including London, there were 4 deaths from enteric fever; none from small-pox; 12 from scarlet fever; 18 from diphtheria; 22 from measles; 15 from influenza. In London itself the diphtheria deaths numbered 6.

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THE LANCET.

LONDON: SATURDAY, AUGUST 30, 1924.

MEDICAL TRAINING.

IN a month from now the medical schools of the country will be commencing the new academic year, and at each centre where training is available young men and women who have selected medicine as a vocation will be joining their fellow-students in the march towards qualification. In the earlier issues of THE LANCET, when special supplements were regularly addressed to intending students, stress was often laid upon the advantage to be derived from entering this or that school, but to-day medical education, wherever provided, must follow to a great extent a uniform plan, a fact which is the clearest proof that during the past century progress along definite lines has been made in the methods of preparing for professional life. Look, for example, at two letters published in THE LANCET last week: one which had somehow escaped previous publication, addressed by the great JOHN HUNTER to the surgical staff of St. George's Hospital, and the other, a comment upon the first, written by THOMAS WILLIAMS who was HUNTER'S senior on the staff of the hospital. The two communications display in a striking manner the pattern of medical education in London at the end of the eighteenth century, and it was the pattern of medical training throughout the country. Medical education was conducted on a system of apprenticeship to the hospital generally—"pupils in common"; or, and more frequently, to individual members of the staff—"pupils in particular," the money received from both sources being at the outset divided equally among the staff. The students paid for their education and obtained in return instruction from the staff and the right to "walk the hospital." The personal contact between what were virtually masters and apprentices had sometimes its advantages, though hardly of a scientific sort; but the disadvantages, in the absence of an organised curriculum, were overwhelming, for it was a matter of chance whether an individual member of the staff took his share in the education of the "pupils in common," while the "pupils in particular" were the objects of a nepotism whose abuses need not be enlarged upon.

That was the condition at the end of the eighteenth century, but our medical students are now trained upon a definite system and with definite objects in view. The system has been slowly evolved and is not a perfect one; nor will it ever reach perfection we are glad to know, for it must always follow on the progress of our science. Systematic training in scientific medicine and surgery was a sequel, but not an immediate sequel, to the work of JOHN HUNTER, and while that great man was himself a hospital officer the curriculum of the student was as fortuitous as can be imagined. The briefest study of this issue of THE LANCET, which is written as a guide to medical education, will show how elaborate the scheme of training is to-day, though it is not more elaborate than might be expected in a curriculum which has been sifted and modified, simplified and amplified as new knowledge has brought new needs. It may be that the simplification is not so obvious as the amplification, for the complaints that the curriculum is overloaded remain general, although we hear at least as frequently the complaints of those who find that adequate instruction is not given along certain lines—obstetrics, ophthalmology, and mental disease, for example, being subjects in which practical equipment has been found wanting. All this is testimony to the fact that medical education is a living affair, conforming to the rules of life, under which the old is perpetually replaced by the new, and purposeful movements are found as the outcome of apparently disconnected facts. Medicine is experiencing at the moment acute phases of this development, and thus the educational course of the student becomes an extremely difficult one: long in time, it requires industry and self-restraint in the worker lest it should become far longer than it is designed by the regulations to be; and complicated in pattern it asks from him a pertinacity that has to be clear-headed as well as unrelaxing. We can well understand the parent looking at what lies before the intending student and asking: Do you really want to be a doctor? And if such a parent inquires further, the following is all the comfort that we can give him, while saying, at the same time, that to the man who knows his own heart, medicine has the finest reward to offer.

The opportunities for practice abroad are increasing, if international reciprocity is still far away, as will be gathered from an annotation on the next page. A graph appears there also which indicates that the profession will be no longer overcrowded, though the drop in the registrations must be interpreted in accordance with the new regulations for study. But the outlook in medicine as a profession has never been more doubtful than it is at the present moment. On all sides changing conditions produce anxiety as to what the future will bring forth. The report of the Lee Committee has so altered the outlook for the Indian Medical Service that many doubt if there is any outlook at all. The stated policy of certain members of the Government now in power, pledging themselves to the principle of State Medical Service, depresses those whose belief is whole-hearted in the individualistic ideals of medical practice. Local sanitary and educational authorities are practising economies in the payment of their medical staffs which are only rendered possible by the economic position of the medical applicants. And on all those who enter private practice rests the fear that they may be mulcted in huge damages for statements made in all good faith, or for measures which have not turned out to the satisfaction of the patient. Those who do not possess a large supply of courage, of industry, and of that quality of moving with the times which is closely related to the spirit of adventure, may be disappointed with their choice of a calling if they join our ranks. But medicine is not a static thing unable to move with social and political development, and, to many of those who look forward to entering it, the dynamic aspect is an attraction. Opportunities are opening before the coming generation which were quite undreamed of by the generation which is passing, and, to all those who possess the qualities, the outlook may certainly be doubtful but will be none the worse for that. Thus there is one answer to the question, "Do you really want to be a doctor?" which will always prevail, and that is an affirmative which depends upon an inward conviction that there is no finer form of service by man to man. Profoundly as medicine has changed since the days of SYDENHAM, LATHAM, and BRIGHT, the ideals set out by those great men (see p. 480) remain constant.

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NAVAL MEDICAL SERVICE.

The life offered to officers of the Royal Naval Medical Service is one that ought to appeal to a large section of recently qualified medical men. There is no intention in what follows, under this or the subsequent headings, to pit one Service against the other or to recruit in one direction more than in another. The particular regulations for each Service should suffice to give each man the necessary impetus for a decision, but it is useless to disguise the fact that the attitude of the authorities in respect to the compulsory retirement at the age of 50 of a group of surgeon commanders who were under contract to be employed until the age of 55 has produced an unfortunate impression. It creates a difficulty for those who are in a position to advise young men as to their future careers when they give counsel based upon engagements which may later be repudiated. The situation has evoked a formal protest from the British Medical Association, and although no specific action was recommended to the Association by its Representative Body, certain protests have found their way into the public press and cannot have failed to prejudice recruiting for the service.

A conference consisting of representatives of the Admiralty and the Medical Department of the Admiralty, and the Services Committee of the British Medical Association was held on Jan. 29th, 1924. A report of this meeting was published in the *British Medical Journal* Supplement of Feb. 16th, 1924. The whole matter of the conditions of the Naval Medical Service is now under consideration by the Board of Admiralty, particularly that of the position of the surgeon-commanders who were compulsorily retired under the new age regulation. It is hoped that the present deliberations will result in the future conditions and status of the Naval Medical Service being placed on a sound working basis satisfactory to all concerned.

In the Navy the young medical officer sees the world in congenial company and with an assured position, the pay is good, the pensions are commensurate, and the opportunities offered now for scientific work are real, while, if they are taken, promotion awaits the officer on grounds of professional merit.

Rank of Surgeon Lieutenant-Commander will be granted to surgeons at the expiration of six years from date of entry, and the point upon which stress should be laid is that special promotion can be made in cases of conspicuous professional merit, which is thus placed on a par with general service. Six years later the period of promotion to Surgeon Commander is reached, after the qualifying examination has been passed, when again special promotions can be made for conspicuous professional merit as well as for distinguished service; but promotions are limited in number, save, of course, for gallantry in action. This recognition of professional attainment should prove a very real incentive to progressive scientific work. The same principle prevails in the higher ranks. Promotions to Surgeon Captain and later to Surgeon Rear-Admiral are made strictly by selection, but are confined to officers who prove fitted, both professionally and as administrators, for this rank.

Naval life may lead to opportunities for putting into practice much of what has been learned in the clinical wards of a hospital. Further, the opening for preventive medicine is large and many-sided, while appointments to the large shore establishments enable medical officers to keep their work modern.

New chemical explosives, as well as the extraordinary behaviour of common articles under extraordinary conditions of stowage, furnish perpetual problems and surprises for the medical officer on board ship, and bring him into intimate connexion with his charges in a way that is particularly necessary considering the conditions of life. No medical officer can expect to succeed unless he secures the confidence of those committed to his charge, and the health lectures which he is bound to deliver will be much more fruitful if they are delivered to an audience which trusts him. Moreover, the delivery of official lectures does not end this side of the medical officer's duties. He must be ready to answer questions, sometimes of real acuteness, which are put to him by the modern blue-jacket, and he will find that his lectures will often afford a starting point of work that may develop into great professional interest. Thus, without his being necessarily a psychologist, his influence will be felt by both officers and men, until the well-being of the ship may be profoundly affected by the extent of his tact and skill; for example, small matters assume undue proportion under stress of confinement, and the medical officer should be quick to detect danger signs and warn his commanding officer. Numerous changes have been introduced during the last 20 years into the naval dietary, many of which were the outcome of representations and research by naval medical officers. The work wants carrying on, for much of it has gone to show that the food problem is very complicated. Every medical officer on board ship should make himself acquainted with food values and the human powers of assimilation under varying conditions of work and climate, and here there is ample scope for research. The modern requirements of gunnery and navigation necessitate precision in their use and have made ophthalmology a valuable subject for study in the Navy. The physical training of both officers and men is based on physiological axioms which are peculiarly the field of the medical officer; this training should be the subject of a watchful eye. There is no lack of scope here for professional work without making any reference to the vast problems which have to be faced when the medical officer has to arrange his particular department to the best advantage during or after an action. It is certain that he will not be able to do this unless in times of peace he gets himself ready by study. Lastly, there is the whole field of venereal and tropical disease.

The young medical officer need not be afraid that his work will be without scientific interest if he takes the opportunities offered him.

Conditions of Service.

The rates of pay of the Medical Service are subject to periodical revision in the light of the cost of living, and it is necessary to indicate as closely as practicable the extent and methods of the periodical revision.

In order that students may be under no misapprehension regarding their remuneration should they decide to join the Naval Medical Service, it should be clearly understood that when the pay of naval officers was revised in 1919 it was definitely laid down that 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay was to be considered as due to the high cost of living in 1919, and that it should be subject to change periodically either upwards or downwards according as the cost of living rose or fell. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., and further revisions (not necessarily reductions) are due every three years—i.e., in July, 1927, July, 1930, and so on.

The pay of the Naval Medical Service is shown in two tables, one showing the scale introduced in 1919, which is described as the standard rates and of which 20 per cent. is variable, and the other showing the actual scale in force from July 1st, 1924, to June 30th, 1927.

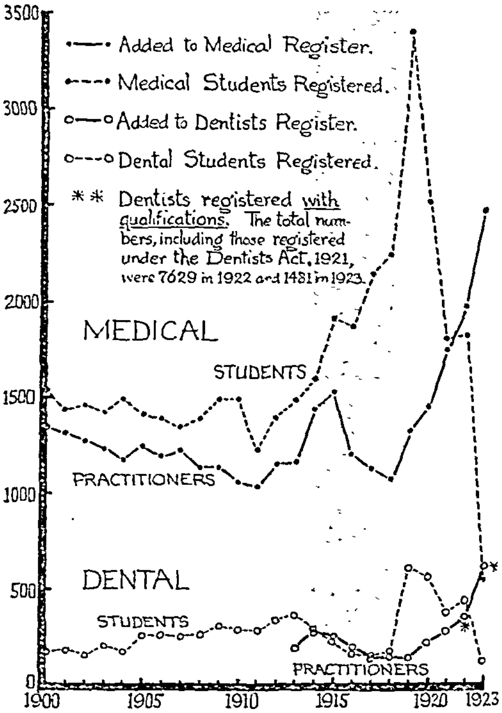
For the time being the regulations for entry by examination into the permanent service are in abeyance, but a short-service scheme providing for transfer to the permanent service has been inaugurated. The regulations for the entry of surgeon lieutenants under this scheme provide for the usual qualifications of registration, good character, physical fitness, and age—the age not to exceed 30 years. The conditions of service are a three years' engagement with an

Annotations.

"Ne quid nimis."

THE PORTAL OF MEDICINE.

A rough idea of the numbers entering the medical profession, both as students and practitioners, may be gained from a study of the accompanying graph, based upon the figures given in the last issues of the Medical and Dental Registers. It should, however, be borne in mind that the number of medical students who were registered last year by the General Medical Council is not a precise indication of those who actually entered upon the curriculum. A certain number of students who would, under the old regulations, have begun the study of chemistry and physics in October, only began their pre-registration work at this time, and instead of being registered in that month will probably register some time this year. It appears, further, that the northern universities are not making arrangements to bring the new curriculum into force until the current year. Consequently students who commence study there are not at present registered. There is no doubt, however, that after these corrections have been applied there will remain a considerable drop in numbers, although it will not be so large as is indicated by the graph when 1923 and 1924 are reviewed together. By reason of the revised curriculum the year 1923 was in some degree an interregnum.



The stippled band represents the period of hostilities, 1914–1918.

PRACTICE ABROAD.

In an annotation which appeared in The Lancet last week, it was pointed out that anyone who has obtained a medical diploma entitling him to have his name printed in any section of the Medical Register becomes at once entitled to practise with little further formality over the greater part of the globe. The range includes, outside the United Kingdom, all the British Dominions and Crown Colonies, with the single exception of British Columbia. He will only require to present the prescribed evidence of the possession of degree or diploma of registration, and, if asked for, of good character, to the proper authorities in Australia, Canada, Ceylon, Hong-Kong, India, Malta, Newfoundland, New Zealand, the Union of South Africa, and the Straits Settlements, in order to enjoy the full privileges and responsibilities of medical practice. In British Columbia those registered prior to 1887 are so entitled; others must pass an examination before a local board, oral and written, in the final professional subjects. Two countries with which there is at present full medical reciprocity are, along with their colonies, also open to all who are on the British Register. These are Japan and Italy. Belgium was in the same category from 1915 to 1920, when a number of Brussels, Louvain, Ghent, and Liége graduates registered in this country, but in the latter year the Belgian authorities saw fit to discontinue the arrangement, and at the same time the Brussels practitioners' degree, an entirely different affair, was discontinued. There is no let or hindrance to record in the reciprocity with Japan; it has apparently worked harmoniously since it was instituted in 1905. But in Italy a temporary difficulty has arisen. Reciprocity was first established in 1901 when practitioners with Italian qualifications became entitled to all the privileges pertaining to British practitioners, but the latter were admitted only to practise amongst foreigners in Italy. In 1910, however, reciprocity became complete, and British practitioners began to enjoy unrestricted freedom of practice in Italy. Last November a registered British medical practitioner, desiring to practise at Ospedaletti, and with the knowledge of the Italian Consul-General in London, was refused permission to do so by the President of the Provincial Medical Board at San Remo, who informed him that he must first obtain an Italian medical diploma. It appears that the provincial authorities had not been apprised of the special agreement between the two countries, and that the matter is likely to be arranged, although those desirous of settling in Italy should bear these facts in mind.

In regard to practice in foreign countries where reciprocity is not in force, the circumstances vary in every possible degree. In China and Siam, for example, there are no regulations whatever restricting practice, whereas in pre-war Austria it was necessary to become naturalised before practice could be begun. In countries nearer home the regulations in France and Switzerland are of special interest; in both procedure has tended to stiffen of recent years. In France it is now necessary to obtain the baccalauréat and to go through the course of study culminating in a medical degree just as any French student would have to do. There is no privilege accorded to medical diplomates as such. In Switzerland it is now obligatory to pass all three professional examinations, as well as the matriculation examination, in the right order; but there is still apparently no obligation to attend courses of study other than are necessary to pass the examinations. In the case of Switzerland there is no reason to believe that the protective measures have been framed in any way with regard to this country: in a land so largely populated by permanent or temporary visitors from adjacent countries of similar speech some such action may be required if it is desired to retain medical practice in the hands of the Swiss themselves. Probably the temporary difficulty in Italy was of the same nature. Negotiations in regard to reciprocity with Spain have made no progress.

Dr. Algernon D. Brenchley has been elected Master of the Society of Apothecaries of London.

London Water.—The eighteenth annual report on the Chemical and Bacteriological Conditions of the London Water-supply has reached us. Written by Sir Alexander Houston, Director of Water Examination, Metropolitan Water Board, it deals with problems of chlorination and filtration, discusses the taste of chlorinated waters, and refers to the various sources of possible contamination. A section is devoted to "medicated" waters, and the repugnance of consumers to the addition of any chemicals to their water-supply is sympathetically noticed.

to hold an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list. It is also proposed to allow a three months' Post-graduate Course to Surgeon Lieutenant Commanders (D) of over two years' seniority.

As in the case of the medical branch, 20 per cent. of the rates of full pay, unemployed pay, half pay, and retired pay introduced in 1919 is considered as due to the high cost of living in 1919 and subject to change periodically either upwards or downwards according as the cost of living rises or falls. The first revision took place in July, 1924, when all the rates were reduced by approximately 5½ per cent., and further revisions are due every three years—i.e., in July, 1927, July, 1930, and so on. The following table and paragraphs show the standard rates introduced in 1919, of which 20 per cent. is variable and the present rates which will operate from July 1st, 1924, to June 30th, 1927. The rates of full pay are as follows:—

Full Pay.

Rank.	Standard rate.						Rate from July 1st, 1924.					
	Year of 365 days.			One day.			Year of 365 days.			One day.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Surg.-Lieut. (D) on entry..	401	10	0	1	2	0	380	4	2	1	0	10
After 3 years	492	15	0	1	7	0	465	7	6	1	5	6
Surg. Lieut.-Comdr. (D) on promotion	593	2	6	1	12	6	559	13	4	1	10	8
After 3 years	629	12	6	1	14	6	596	3	4	1	12	8
" 6 "	666	2	6	1	16	6	629	12	6	1	14	6
" 9 "	730	0	0	2	0	0	690	9	2	1	17	10
Surg.-Comdr. (D) on promotion	775	12	6	2	2	6	733	0	10	2	0	2
After 3 years	848	12	6	2	6	6	803	0	0	2	4	0
" 6 "	921	12	6	2	10	6	869	18	4	2	7	8
" 9 "	994	12	6	2	14	6	939	17	6	2	11	6

On first appointment to the Service, Dental Officers will receive full pay from the date of appointment, but subject to the provisions of Article 1347 of the King's Regulations, 1913.

Dental Officers are eligible for the same rates of lodging and provision allowances as other officers of equivalent rank and are entitled to the same privileges. The rates of half-pay are:—

Unemployed Pay and Half Pay.—A distinction is to be drawn between—

(*a*) Officers awaiting employment.

(*b*) Those who are permitted for private reasons which the Admiralty regard as satisfactory to refuse an appointment or to have their appointment cancelled or who are unemployed at their own request or in consequence of misconduct.

In the former case—

(*a*) Officers are to receive unemployed pay as follows:—

For the first six calendar months full pay of rank (without allowances).

For the next six calendar months:—

Rank.	Standard rate per diem.			Rate per diem from July 1st, 1924.		
	£	s.	d.	£	s.	d.
Surgeon Lieutenants (D)	0	17	0	0	16	0
Surgeon Lieutenant Commanders (D) ..	1	2	6	1	1	3
Surgeon Commanders (D)	1	7	6	1	6	0

Thereafter:—Half the full pay of their rank and seniority on the Executive Officers' scale, namely:—

Rank.	£	s.	d.	£	s.	d.
Surgeon Lieutenant (D)	0	8	6	0	8	0
" " of 4 years' seniority	0	10	0	0	9	5
Surgeon Lieutenant Commander (D)	0	15	0	0	14	2
" " of 3 years' seniority	0	16	0	0	15	0
" " of 6 years' seniority	0	17	0	0	16	1
Surgeon Commander (D)	1	0	0	0	18	11
" " of 3 years' seniority	1	2	0	1	0	9
" " 6 " "	1	4	0	1	2	8
" " 9 " "	1	6	0	1	4	7

Unemployed pay will not, however, be granted in cases where an officer is undertaking continuous professional work for which payment is made.

In the latter case, (*b*), Officers may receive half the full pay of their rank and seniority on the Executive Officers' scale.

Periods during which unemployed Full Pay or Unemployed Pay are received will only count as half-pay time—that is, as one-third of full service.

An Officer who is permitted, for private reasons, to decline an appointment, or to have his appointment cancelled will not be entitled to any Unemployed Pay. In such cases, Officers may be placed on Half-Pay.

The conditions of retirement, Widows' Pensions, Leave, &c., are the same as for medical officers of equivalent rank and seniority.

Arrangements are also made whereby officers may be allowed to withdraw from the Service after four years' service and receive gratuities on the following scale:—

Gratuities will be awarded on retirement and withdrawal on the undermentioned scale.

Rank.		Gratuity.		
		£	s.	d.
Surgeon Lieutenant (D), Surgeon Lieutenant-Commander (D), and Surgeon Commander (D):				
After 4 years' full-pay service	including service allowed by paragraph 3	500	0	0
,, 8 ,, ,,		1000	0	0
,, 12 ,, ,,		1500	0	0
,, 16 ,, ,,		2250	0	0

ARMY MEDICAL SERVICE.

THE recent alterations in the conditions of service in the Royal Army Medical Corps, which constituted, as we said at the time, the greatest reform that has taken place in that Service for a generation, have well fulfilled their promise. For many reasons which are obvious and have been detailed on previous occasions, the Service can be thoroughly recommended to young medical practitioners. Competitive examinations for commissions into the R.A.M.C. are held twice a year, usually in January and July. The Regulations for admission to the R.A.M.C. should be obtained from the Army Medical Department, War Office, London, S.W. 1, and carefully studied.

These are the things which the man who contemplates joining the Service should bear in mind. The rates of pay and allowances are good; the chances of seeing the world and the opportunities for post-graduate study are generous, and the work is nowadays varied, responsible, and interesting. At certain periods the young officer is relieved from all other duties for five months for the purpose of post-graduate study. During this period he is on full pay and the fees for his courses of instruction are paid by the State. His time is devoted to post-graduate work, and the leading clinical and scientific institutions are coöperating to secure that this post-graduate work shall be real and fruitful. Officers who show a marked aptitude for special subjects and have had previous practical experience in them are now selected to undergo a specialist course lasting for a further four months, thus giving these officers a post-graduate course of nine months. At the same time, in districts where the privilege would be of the most practical value, opportunities are forthcoming for young officers to attend the clinical practice of large local general hospitals.

By a Royal Warrant issued in September, 1919, medical and combatant officers were placed on the same footing as regards retired pay, and the fact that medical officers enter the Service after a long and expensive training some five years later in life than combatant officers was overlooked. This inequality of treatment has now been rectified, with the result that a medical officer of 20 years' service or over gets £70 per annum more pension than a combatant officer with the same number of years' service.

Once again let us deal with the most frequently repeated criticism of the Service—namely, that option of a further year, to serve when and where required under the general rules of the service as regards discipline, and to rank with, but after, surgeon lieutenants in the permanent service, and to receive two calendar months' notice of services being no longer required.

As from July 1st, 1924, the pay is £1 5*s.* (standard rate £1 6*s.* 6*d.*) per day or £456 5*s.* (standard rate £483 12*s.* 6*d.*) per annum, while there is a gratuity, not subject to variation with the cost of living, on discharge of £8 6*s.* 8*d.* for each completed month of service. All officers during service are accommodated and victualled on the usual service scale or receive lodging money and provision allowance in lieu, at rates subject to periodical revision. The present rates of lodging money and provision allowance are £80 and £55 a year respectively. Unlike permanent officers, medical officers entered for short service are not liable to periods of unemployment on unemployed or half pay or eligible for retired pay in respect of service. If, however, such an officer were invalided for a cause certified by the competent naval medical authority as attributable to the conditions of service, he would be eligible for disability retired pay in lieu of the gratuity on discharge referred to above. Similarly, in the event of his death from a cause attributable to the service his widow and children would be treated in the same manner as the widow and children of an officer on the permanent list. There is an equipment allowance for ordinary uniform of £50, but the officer provides himself with a pocket case of instruments and a stethoscope.

A short-service surgeon lieutenant after six months' service, on application to the Secretary of the Admiralty, may be considered for transfer to the permanent service on a satisfactory report being received from the senior medical officer of the Squadron, Hospital or Depôt in which he has served or is serving as to his professional ability, and a favourable report from his commanding officer as to conduct. Such candidates must have been under the age of 28 on joining for short service, and officers so transferred will not be eligible for the gratuities provided. They will be permitted to count their seniority from date of entry for short service for purposes of promotion and for increment of full pay, and similarly they will be permitted to count their service from the date of entry for purposes of retired pay, but for purposes of retiring gratuity on the permanent officers' scale their services will be reckoned only from the date of transfer to the permanent list, this date being that of receipt in the ship or establishment in which the officer is serving of the order for his transfer to the permanent list. Until that date he will retain his temporary rate of pay.

If a short-service lieutenant transfers to the permanent service he will then come under the following conditions of pay and pensions :—

Standard and Present Rates of Pay.

Rank.	Standard rate.						Rate from July 1st, 1924.					
	Year of 365 days.			One day.			Year of 365 days.			One day.		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
Surg.-Lieut. on entry ..	438	0	0	1	4	0	413	13	4	1	2	8
After 3 years	529	5	0	1	9	0	498	16	8	1	7	4
Surg. Lieut.-Comdr. on promotion	638	15	0	1	15	0	602	5	0	1	13	0
After 3 years	675	5	0	1	17	0	638	15	0	1	15	0
Surg.-Comdr. on promotion	821	5	0	2	5	0	775	12	6	2	2	6
After 3 years	894	5	0	2	9	0	845	11	8	2	6	4
„ 6 „	967	5	0	2	13	0	915	10	10	2	10	2
„ 9 „	1040	5	0	2	17	0	982	9	2	2	13	10
Surg.-Capt. on promotion	1186	5	0	3	5	0	1122	7	6	3	1	6
After 3 years	1277	10	0	3	10	0	1207	10	10	3	6	2
„ 6 „	1368	15	0	3	15	0	1292	14	2	3	10	10
„ 9 „	1460	0	0	4	0	0	1380	18	4	3	15	8
Surg. Rear-Admiral ..	1916	5	0	5	5	0	1809	15	10	4	19	2

On first appointment to the service, medical officers will receive full pay from date of appointment, but subject to the provisions of Article 1347 of the King's Regulations.

Officers of the permanent service are eligible during periods of unemployment for unemployed pay and half pay. The rates of unemployed pay and half pay, and the conditions under which they are granted, are the same as in the dental branch and are set forth in detail later in this article.

Flag Allowances.

An allowance of 5*s.* a day in addition to full pay is granted to the Senior Medical Officer of a flagship bearing the flag of a Commander-in-Chief. An allowance of 2*s.* 6*d.* a day is granted to the Senior Medical Officer of a ship bearing other flags or broad pendants.

Standard Rates of Retired Pay.

Compulsory retirement will be as follows :—

(i) Surgeon Rear-Admirals retire at the age of 60 with retired pay at the rate of £900 per annum plus £22 per annum for each year's service over 27 years counting for retired pay, subject to a maximum rate of £1010 per annum. If, however, less than 27 years' service counting towards retired pay is rendered, a deduction of £22 per annum is made for each full year wanting to complete that period, subject to a minimum of £790 per annum.

(ii) Surgeon Captains retire at the age of 55. Maximum retired pay, £900.

(iii) Surgeon Commanders retire at the age of 50. Maximum retired pay, £600.

(iv) Surgeon Lieutenant-Commanders and Lieutenants retire at the age of 45. Maximum retired pay, £450.

Subject to these maxima, the rates of retired pay for Surgeon Captains, Surgeon Commanders, Surgeon Lieutenant-Commanders, and Surgeon Lieutenants are as follows :—

Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)		Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)	
			Addition.	Deduction.				Addition.	Deduction.
	£ (p.a.)		£ (p.a.)	£ (p.a.)		£ (p.a.)		£ (p.a.)	£ (p.a.)
55	790	24	22	15	47	562	20	15	15
54	765	24	22	15	46	525	20	15	15
53	742	23	22	15	45	487	19	15	15
52	720	23	22	15	44	450	19	15	15
51	697	22	22	15	43	412	18	15	15
50	675	22	15	15	42	375	18	15	15
49	637	21	15	15	41	337	17	15	15
48	600	21	15	15	40	300	17	15	15

(p.a.) = per annum.

(A) Addition for each full year's service in excess of that specified in column 3 or deduction for each full year wanting to complete that period of service—addition or deduction limited to five years in each case.

Twenty per cent. of all the rates of retired pay referred to above is variable with the cost of living, and the rates at present in course of payment are approximately 5½ per cent. below those given above.

DENTAL BRANCH.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of Surgeon Commander (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Entry is by competition, the Competitive Entrance Examination being similar in scope to the Final Qualifying Examination. Candidates are required to produce the usual certificates of birth, registration and of character, and must be physically fit for service anywhere. They must not be more than 28 years of age on the day of commencement of the entrance examination. An outfit allowance of £50 is payable to officers finally entered and commissioned.

Provision has been made for candidates who, at the time of passing the examination, hold or are about

Retirement and Retired Pay.

The following are the rates of pension and retired pay:—

1. Retired pay will consist of two parts: (*a*) a service element based on the officer's total service; (*b*) a rank element for the rank from which the officer retires. An officer with less than 20 complete years' service will not be eligible for retired pay.

2. The scale will be as follows, subject to the reduction of 5½ per cent. referred to below:—

(*a*) Service element.—£15 a year for each completed year of service as a medical officer.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant - Colonel	150	30	240
Colonel	290	50	390
Major-General ..	440	50	540
Lieutenant - General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together:—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General	1200

The above rates are those laid down in the Pay Warrant. They have been reduced by 5½ per cent. as from July 1st, 1924. (See footnote *.)

3. Officers with 8½ and less than 20 years' service as medical officers may be permitted to retire with a gratuity varying from £1000 to £2500.

Arrangements have been made for the appointment of Consultants in both Medicine and Surgery and the ranks of Colonel and Major-General will now be open to such Officers. The duties of these Officers are to visit all Commands and advise the Director-General, as the result of their inspections on the spot, with regard to the professional work being carried on in the hospitals, and the degree of efficiency attained by the personnel with whom they are respectively concerned. This should ensure a high standard of performance if only because of the satisfactory feeling that good work will not by accident remain unnoticed.

The present holders of these posts are Consultant in Surgery, Colonel J. W. West, late Professor of Surgery at the Royal Army Medical College; Consultant in Medicine, Colonel J. C. Kennedy, late Professor of Tropical Medicine at the Royal Army Medical College.

THE ARMY DENTAL CORPS.

The Corps is administered by the Director-General, Army Medical Services. It is a joint service for the Army and Royal Air Force and personnel is required to serve under either force and be interchangeable. Officers and other ranks posted for duty with the Royal Air Force will perform their duties under the Regulations of the Royal Air Force for the employment of dental personnel, but the conditions in the following tables apply equally in either force. Promotion is carried out on one general list. The regulations for admission to the Army Dental Corps should be obtained from the Secretary, War Office, and carefully studied.

OFFICERS: *Appointment and Promotion.*

1. Commissions as lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer shall be eligible for promotion to the rank of captain on completion of three and a half years' service in the Corps provided he has previously qualified in such manner as may be prescribed by the Army Council.

3. Promotion to the rank of major and lieutenant-colonel to fill the establishments laid down from time to time for those ranks, shall be made by selection of the Army Council, provided the officer has previously qualified for promotion to those ranks in such manner as may be prescribed by the Army Council.

4. Certain appointments in the rank of lieutenant-colonel and major have been approved to fill the establishment. The remainder of the appointments are in the rank of lieutenant, except in cases where service of three and a half years or more has been given as a temporary dental officer when the rank of captain will be given. Service as a temporary dental officer will count towards the three and a half years for promotion to captain.

Pay.

The following are the rates for officers of the Army Dental Corps:—

	Per diem. £	s.	d.
Lieutenant	0	18	10
Captain	1	3	8
Captain after 6 years' total service ..	1	5	0
Captain „ 10 „ „ „	1	7	0
Major	1	11	2
Major, after 15 years' total service	1	15	10
Lieut.-Colonel	2	4	10
Lieut.-Colonel after 20 years' total service ..	2	7	4
Lieut.-Colonel „ 25 „ „ „ ..	2	9	8

These rates are 5½ per cent. below those shown in the Pay Warrant, 1922. The latter, when granted, were made subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place on July 1st, 1927.

Allowances.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the R.A.M.C.

Retirement and Retired Pay or Gratuity.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed:—

After 8½ years' service in the Corps, gratuity of	£1000.
„ 15 „ „ „	£1800.
„ 18 „ „ „	£2500.

(4) Retirement will be compulsory at the age of 55 years.

(5) A lieutenant who does not qualify for promotion within three and a half years' service in the Corps will be retired; and a captain who fails to qualify for promotion to major within twelve years' service in the Corps will be retired on any gratuity for which he may be eligible under paragraph 3.

Other Ranks.

The rates of pay of warrant officers, non-commissioned officers and men are those provided in the Warrant of Sept. 13th, 1919, *vide* Army Order 324 of 1919.

The aim of the Corps is the prevention of wastage of man power on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier will be re-inspected at least once a year and his dental efficiency maintained at the best standard possible. As recruits are not now enlisted unless they have sufficient natural teeth to enable them to masticate efficiently it is hoped that the conservative nature of the treatment they will receive will reduce considerably the percentage of artificial dentures required.

The "other ranks" of the Corps consist of dental mechanics and clerk orderlies. Training of dental mechanics has been proceeding for some time at the Central Dental Laboratory, Aldershot, and it is not proposed to open recruiting at present for this section. A limited number of clerk-orderlies is now being enlisted, and these men receive their training at the Royal Army Medical Corps Depôt.

ROYAL ARMY MEDICAL CORPS: PAY AND ALLOWANCES.

Rank.	Pay per diem.*	Rations†	Servant.	Married.			Unmarried.		Approximate yearly total.	
				Lodging.	Fuel and light† (average)	Furniture allowance.	Lodging†	Fuel and light (average)	Married.	Unmarried.
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£	£
Lieutenant	1 0 10	1 8	2 0	3 6	1 8	2 0	2 3	1 4	578	513
Captain	1 5 6	1 8	2 0	4 6	3 4	2 0	3 0	1 10	712	621
Captain, after 6 years ..	1 6 6	1 8	2 0	4 6	3 4	2 0	3 0	1 10	730	639
Captain, after 10 years..	1 9 4	1 8	2 0	4 6	3 4	2 0	3 0	1 10	782	690
Major	1 13 0	1 8	2 0	4 6	3 4	2 0	4 0	2 7	849	789
Major, after 15 years ..	1 17 10	1 8	2 0	4 6	3 4	2 0	4 0	2 7	937	878
Lieutenant-Colonel ..	2 7 4	1 8	2 0	4 6	3 4	2 0	4 6	2 7	1110	1060
Lt.-Colonel, after 20 years	2 9 8	1 8	2 0	4 6	3 4	2 0	4 6	2 7	1153	1103
Lt.-Colonel, after 25 years	2 12 0	1 8	2 0	4 6	3 4	2 0	4 6	2 7	1195	1145
Colonel	3 1 6	1 8	2 0	5 6	4 7	2 0	5 6	3 1	1410	1346
Major-General	4 9 10	1 8	4 0	11 0	5 10	2 0	11 0	4 2	2086	2019

* Pay Warrant rates less 5½ per cent. from July 1st, 1924, vide A.O. 93 and 204 of 1924. The Pay Warrant rates when granted were made subject to revision to an extent not exceeding 20 per cent., according to variation in the cost of living. The next revision takes place from July 1st, 1927.

† Rates of allowances vary from time to time and issues are subject to conditions laid down in the Allowance Regulations.

administration eternally takes the *pas* of science. The Directorates in Pathology and Hygiene which were recently created in the R.A.M.C., and which we may say have proved a marked success, form a complete answer to such criticism, however just it was in the past. This scheme of creating Directorates permits specially selected men to rise from all ranks to Major-General on the strength of their scientific work. Hitherto, a few notable men being excepted, the rule in the R.A.M.C. has been that, whatever a man's qualifications or abilities, on attaining the rank of Lieutenant-Colonel, he must be prepared to go off into administrative work and leave his scientific duties to his juniors. If he preferred to remain working in bacteriology, in preventive medicine and hygiene, or in tropical diseases, for example, he could do so, but, except in extraordinarily fortunate circumstances for himself, he would find that his devotion to science had cost him all chances of further rise in his Service, promotion being reserved for the administrative billets. This now has all been changed, and the change has its expression in these Directorates. All ranks up to and including the rank of Lieutenant-Colonel can draw specialist pay and hold appointments carrying allowances. The following is the scale of additional pay and charge pay:—

Additional Pay and Charge Pay for Officers of the R.A.M.C.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by Our Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under, within a limit of 5*s.* a day:—

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology, including Venereal Disease, 5*s.* daily.

Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 2*s.* 6*d.* daily.

Officers granted temporary higher rank while holding appointments in the services of hygiene and pathology will not be eligible for additional pay as specialists while holding such temporary rank.

(2) (*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds	.. 2*s.* 6*d.* daily.	300 beds	.. 7*s.* 6*d.* daily.
150 „	.. 5*s.* 0*d.* „	500 „	.. 10*s.* 0*d.* „

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

	Daily. *s.* *d.*
(*b*) Senior medical officer, Royal Arsenal not exceeding	10 0
(*c*) Officer in command of the depôt, Royal Army Medical Corps	5 0
(*d*) The senior officer of Our Army Medical Service with an army in the field: A rate to be fixed by Our Army Council according to the magnitude of the charge.	
(*e*) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5 0
(*f*) Adjutant R.A.M.C. Depôt	5 0
(*g*) Adjutant R.A.M.C. (Territorial Army)	2 6

Further, an officer, graded as a specialist, and appointed to the charge of a medical or surgical division of a general hospital may be allowed to retain his additional pay and to draw the rate of charge pay laid down for the officer in charge of a medical or surgical division of a general hospital, provided that the total of additional and charge pay so drawn does not exceed the rate of charge pay drawn by the officer in charge of the hospital. With this exception charge pay and additional pay as specialist will not be issuable concurrently. It may be here pointed out that the distinction between scientific and administrative work is largely verbal. Take the conduct of a large hospital—is it possible to separate the scientific routine which is designed to ensure progressive therapeutics from the administrative work which provides and maintains the premises and service, and selects and oversees the personnel?

Under the conditions enumerated the possibilities for good workers is very great in the R.A.M.C.; they will attain to positions of proper trust and emolument by scientific work. This should much improve recruiting among the officers of the R.A.M.C. But there will almost certainly follow arrangements by which all special medical service will receive higher consideration in the Corps. Not only is there in the work of the Army Medical Department scope for original labour and research in tropical disease, in preventive medicine, and in bacteriology, as well as in the vast clinical field open to the specialist in medicine, surgery, or gynæcology, in venereal disease, in ophthalmology, and so on, but it is proposed to develop a scheme whereby child welfare shall be undertaken systematically by the R.A.M.C. A scheme of this sort is already running successfully at Aldershot, and we see in this direction a fine opening for preventive medicine, and one which should bring the officers of the R.A.M.C. into touch with the soldiers in a valuable and intimate manner.

The above schemes for the stimulation of purely professional work among officers of the Corps must not be taken to imply that instruction in administrative work has been overlooked. One of the lessons of the war was that good administration must exist for the fullest benefit to be obtained from the professional talent available. The necessity of training officers who may display capacity for organisation and administration has not been lost sight of, and there are many appointments of varying degrees of importance and responsibility open to officers who desire to take up this side of the Corps' duties.

TABLE I.—AIR FORCE MEDICAL SERVICE: RATES OF PAY.

1. The following is an outline of the emoluments issuable to officers of the Medical Branch of the Royal Air Force at present. Allowances are issued only when accommodation, fuel, light, rations and personal attendance are not available and the rates vary in different countries.

—	Pay. Daily. Standard rate.	Pay. Daily. Rate from July 1st, 1924.	Pay. Yearly. Rate from July 1st, 1924.	Allowances (daily rate at home). Lodging.	Allowances. Fuel and light (average). Married.	Allowances. Fuel and light (average). Single.	Allowances. Ration.	Allowances. Servant.	Total allowances at home. Daily. Married.	Total allowances at home. Daily. Single.	Total allowances at home. Yearly. Married.	Total allowances at home. Yearly. Single.	Total emoluments at home. Daily. Married.	Total emoluments at home. Daily. Single.	Total emoluments at home. Yearly. Married.	Total emoluments at home. Yearly. Single.
	£ s. d.	£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Flying Officer	1 4 0	1 2 8	413 13 4	3 6	1 8	0 10	1 8	2 0	8 10	8 0	161 4 2	146 0 0	1 11 6	1 10 8	574 17 6	559 13 4
Flight Lieutenant	1 6 0	1 4 6	447 2 6	4 6	3 4	0 10	1 8	2 0	11 6	9 0	209 17 6	164 5 0	1 16 0	1 13 6	657 0 0	611 7 6
" " after 2 years' service in the substantive rank..	1 8 0	1 6 6	483 12 6	4 6	3 4	0 10	1 8	2 0	11 6	9 0	209 17 6	164 5 0	1 18 0	1 15 6	693 10 0	647 17 6
" " " 4 " "	1 10 0	1 8 4	517 1 8	4 6	3 4	0 10	1 8	2 0	11 6	9 0	209 17 6	164 5 0	1 19 10	1 17 4	726 19 2	681 6 8
Squadron Leader..	1 14 0	1 12 2	587 0 10	4 6	3 4	1 6	1 8	2 0	11 6	9 8	209 17 6	176 8 4	2 3 8	2 1 10	796 18 4	763 9 2
" " after 2 years' service in the substantive rank ..	1 16 0	1 14 0	620 10 0	4 6	3 4	1 6	1 8	2 0	11 6	9 8	209 17 6	176 8 4	2 5 6	2 3 8	830 7 6	796 18 4
" " " 4 " "	1 18 0	1 15 10	653 19 2	4 6	3 4	1 6	1 8	2 0	11 6	9 8	209 17 6	176 8 4	2 7 4	2 5 6	863 16 8	830 7 6
" " " 6 " "	2 2 0	1 19 8	723 18 4	4 6	3 4	1 6	1 8	2 0	11 6	9 8	209 17 6	176 8 4	2 11 2	2 9 4	933 15 10	900 6 8
Wing Commander	2 6 0	2 3 6	793 17 6	4 6	3 4	2 1	1 8	2 0	11 6	10 3	209 17 6	187 1 3	2 15 0	2 13 9	1003 15 0	980 18 9
" " after 2 years' service in the substantive rank ..	2 10 0	2 7 4	863 16 8	4 6	3 4	2 1	1 8	2 0	11 6	10 3	209 17 6	187 1 3	2 18 10	2 17 7	1073 14 2	1050 17 11
" " " 4 " "	2 12 0	2 9 2	897 5 10	4 6	3 4	2 1	1 8	2 0	11 6	10 3	209 17 6	187 1 3	3 0 8	2 19 5	1107 3 4	1084 7 1
" " " 6 " "	2 14 0	2 11 0	930 15 0	4 6	3 4	2 1	1 8	2 0	11 6	10 3	209 17 6	187 1 3	3 2 6	3 1 3	1140 12 6	1117 16 3
Group Captain	3 0 0	2 16 8	1034 3 4	5 6	4 7	3 1	1 8	4 0	15 9	14 3	287 8 9	260 1 3	3 12 5	3 10 11	1321 12 1	1294 4 7
" " after 2 years' service in the substantive rank ..	3 4 0	3 0 6	1104 2 6	5 6	4 7	3 1	1 8	4 0	15 9	14 3	287 8 9	260 1 3	3 16 3	3 14 9	1391 11 3	1364 3 9
" " " 4 " "	3 8 0	3 4 4	1174 1 8	5 6	4 7	3 1	1 8	4 0	15 9	14 3	287 8 9	260 1 3	4 0 1	3 18 7	1461 10 5	1434 2 11

2. The above rates of pay are liable to revision. The standard rates were drawn up in 1919 in the light of the then high cost of living, and 20 per cent. of each of the standard rates is regarded as detachable and subject to alteration, either upwards or downwards as the cost of living rises or falls. The first revision took effect from July 1st, 1924, when a reduction of approximately 5½ per cent. was made in the standard rates. Subsequent revisions will be made at intervals of three years.

3. It must, however, be clearly understood that while every consideration will be given to the reasonable and legitimate interests of individuals, it will be competent for the Air Council at any time to modify the regulations under which the emoluments of the R.A.F. are drawn, and no Officer will be entitled to claim any pay, gratuity, or other advantage conferred by a provision being at any time added to, varied, or cancelled.

4. For the purpose of the issue of allowances a "married officer" is one who is married and has attained the age of 30 or the substantive rank of Squadron Leader or who, irrespective of age and rank, was married on or before Sept. 15th, 1919, and was serving in the Royal Air Force on June 8th, 1922.

5. As allowances are given for specific purposes, the cost of which may vary at comparatively short intervals, the rates of allowances are liable to be reviewed as circumstances may require.

6. A colonial allowance is granted in certain commands abroad in aid of the expenses of living in the countries where the cost is higher than in the United Kingdom.

7. For periods of service given under Indian administration and payment, officers will come under the rates and conditions authorised from time to time by the Indian Government in so far as these rates and conditions may differ from those in this scheme. The Indian rates are at present under review.

INDIAN MEDICAL SERVICE.

WE cannot foretell how and to what extent the Indian Medical Service will be affected by the report of the Royal Commission on the Superior Civil Services in India. The report is the outcome of the Indian reform scheme, the essence of which is an increasing participation by Indians in the government of the country, and as far as the Indian Medical Service is concerned, the recommendations of the Commission can be summarised almost in a sentence. Contrary to the recommendation of the Verney-Lovett Committee, the Commission has recognised that the medical needs of both the British and Indian armies in India should be provided for in future by the Royal Army Medical Corps (India) which should absorb the Indian Medical Service, no attempt being made to perpetuate that service as at present constituted. This recommendation is in accordance with the scheme elaborated by Sir Charles Burtchaell in 1919, and printed at length as an appendix to the Commission's report. At the same time, a new civil medical service is to be constituted in each province recruited by competitive examinations held both in England and India. To meet the medical needs of British officers in the Civil Service and their families a minimum number of British officers is to be maintained in this civil medical service, the limit to be prescribed for each province by the Secretary of State, on whom in the last resort is to rest the responsibility for their maintenance. Of this British element, one half, or the number required for the military reserve (whichever is the larger), is to be reserved for British officers seconded from the R.A.M.C., the remainder being those succeeding in competitive examination. It is further recommended that, subject to the existing rights of present members of the Indian Medical Service, all scientific chairs in Government colleges and hospitals shall be thrown open to all candidates, the clinical chairs alone being reserved for members of the civil medical services so far as suitable candidates are available.

We set out last year in detail the conditions of pay, leave and pension under which appointments were then being made to the Service. These conditions are no longer relevant to new appointments, for, if the recommendations of the Lee Commission are accepted, no more appointments will be made under them, and meanwhile recruitment has been temporarily suspended. It should be added, however, for the information of those already in the Service, that the basic pension rates there stated have been made liable to a "cost of living" reduction with effect from July 1st, 1924. The amount of reduction has not yet been fixed, but will not exceed 5½ per cent.

Whatever the ultimate arrangements may be, the necessity will remain to provide a European medical service in India so long as Europeans are employed in the various departments of the Civil Service. The time cannot be far distant when the Government will again be obliged to call for applicants for this Service, the terms of which are presumably now under discussion.

WOMEN'S MEDICAL SERVICE FOR INDIA.

THIS service is open to fully qualified medical women of British or Indian nationality who desire to carry on work in India. With the present amount of Government subsidy the number of medical officers is limited to 40. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are as follows:—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to 3	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1s. 4*d*.

Furnished quarters are provided, representing an additional Rs.150 per mensem.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent. which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Major-General J. B. Smith, India Office, Whitehall, London.

AIR FORCE MEDICAL SERVICE.

THE Royal Air Force Medical Service offers a career for medical men which should prove both attractive and interesting. The rates of pay and allowances are good, and a new field of scientific interest is opened up by the manifold problems which the circumstances of aviation produce. The physical and mental fitness for, and reaction to, the varied conditions under which the flying personnel perform their functions provide much scope for research. As promotion to the higher ranks of the Service is by selection, and as a certain proportion of the higher ranks will be reserved for purely scientific, as opposed to administrative, appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in scientific research, as well as for those who develop a talent for administration.

COLONIAL MEDICAL SERVICE.

IN the self-governing dominions, Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland, and territories under their control, such as Papua and the Cook Islands, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; appointments in Egypt and the Soudan are regulated from the Foreign Office; in Southern Rhodesia the appointments are made by the local Government, but the British South Africa Company, London Wall Buildings, E.C., act as their agents in this country; in North Borneo application should be made to the British North Borneo Company, 37, Threadneedle-street, E.C., for appointments; and those in Sarawak are in the hands of H.H. the Rajah. Much valuable information will be found in the "Professional Handbook," Part II., issued by the Oversea Settlement Office, 3 and 4, Clement's Inn, Strand, London, W.C. 2, price 9*d*.

As a general rule, each Colony or Protectorate has its own public service distinct from that of every other; and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another. There are three exceptions to this rule: (*a*) The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, is one service. (*b*) The East Africa Medical Service, which serves Kenya, Uganda, Zanzibar, Nyasaland, Somaliland, and the Tanganyika Territory is one service. (*c*) In practice the medical services of the Straits Settlements and the Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States or vice versa.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the Secretary of State for the Colonies are (*a*) the West African—viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia; (*b*) the East African—viz., the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, the Tanganyika Territory, and Northern Rhodesia; (*c*) the Eastern—viz., Ceylon, the Straits Settlements and Malay States, Hong Kong, Mauritius, and Seychelles; (*d*) the West Indian—viz., British Guiana, Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, British Honduras, and the Bahamas; (*e*) Fiji and the Western Pacific, Cyprus, Malta, Gibraltar, St. Helena, Bermuda, and the Falkland Islands; and (*f*) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. Appointments in Malta are all filled locally. Vacancies occur most regularly and frequently in the West African Medical Staff, the East African Medical Service, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift of the Secretary of State for the Colonies should be between the ages of 23 and 35,[1] and must be doubly qualified; preference will be given to those who have held hospital appointments as house physicians and house surgeons; testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Sir J. Rose Bradford, 8, Manchester-square, London, W. 1; Sir J. Hawtrey Benson, 57, Fitzwilliam-square, Dublin; Lieut.-Colonel Glen Liston, C.I.E., I.M.S., 33, Comely Bank, Edinburgh; and Dr. R. H. Kennan, 2, St. James's-road, Liverpool. Applications for such appointments must be addressed to the Private Secretary (Appointments), Colonial Office, Downing-street, S.W. 1.

EAST AFRICAN MEDICAL SERVICE.

The Medical staffs of the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory form one service, the members of which are liable to be posted to any of the Dependencies as the exigencies of the service may require. The preferences of individual officers are, however, taken into consideration as far as possible.

Selected candidates are appointed as medical officers on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Unless the Secretary of State directs to the contrary, they are required to attend a course of instruction at the London or Liverpool School of Tropical Medicine before taking up their appointments. If such a course is not taken before proceeding to East Africa, they are required to take it during their first leave of absence. Medical officers (but not medical officers of health) are permitted to take private practice, on the understanding that they give precedence to their official duties. It must be understood that, as a general rule, additions to their income from this source are not likely to be substantial.

The currency in different Dependencies in East Africa varies. In Kenya, Uganda, and the Tanganyika Territory, an East African shilling (one-twentieth of a pound sterling) is the standard coin. Salaries and sterling allowances are issued locally in respect of resident service at a fixed rate of 20 shillings to the pound sterling. A special local allowance, averaging 15 per cent. of sterling salaries and allowances is at present issued in respect of resident service. The question of the continuance or otherwise of the allowance will be subject to review on Dec. 31st, 1924. In Zanzibar and Somaliland the Indian rupee is the standard coin, and for the present sterling salaries and allowances are issued at a fixed rate of 15 rupees to the pound. No local allowance is paid. In Nyasaland sterling currency is used, and no local allowance is paid.

Medical officers are provided with quarters free of rent (but not of rates or other similar outgoings), if quarters are available; if quarters are not available, the Government may provide temporary accommodation or alternatively, at the discretion of the Government, an allowance in lieu of quarters calculated at 15 per cent. of the initial salary of an officer's appointment may be paid. The salary of a medical officer is £600 per annum, rising by annual increments of £25 to £900 per annum, with efficiency bars at £700 and £800.

Medical officers in East Africa are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity, he thereby forgoes all claim to pension.

The grades and salaries (apart from ordinary medical officers) in the medical departments are as follows:—

Kenya: Principal Medical Officer, £1200; Deputy Principal Medical Officer, £1000; Principal Sanitation Officer, £1000; Resident Surgeon, Nairobi European Hospital, £900–50–1000; Senior Medical Officers, £800–25–900; Sanitation Officers, £800–25–900; Bacteriologist, £900–50–1000; First Assistant Bacteriologist, £800–25–900; Second Assistant Bacteriologist, same scale as Medical Officer.

Uganda Protectorate: Principal Medical Officer, £1200; Deputy Principal Medical Officers (two, one being for Native services), £1000; Principal Sanitation Officer, £1000; Resident Surgeon, Kampala Hospital, £900; Sanitation Officer, £800–25–900; Senior Medical Officers, £800–25–900;

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[1] In the case of East Africa, preference will be given to candidates who are over 25 years of age. In the case of Fiji and the Western Pacific, preference will be given to candidates who are under 30. At the present time, however, no definite age-limits are insisted on; but officers over the age of 35 must be prepared to serve, if required, on a temporary and non-pensionable footing.

The establishment will consist partly of permanent and partly of short-service officers. An officer will on first entry be granted a short-service commission for a period of two years on the active list (which may be extended to four years at the discretion of the Air Council on recommendation of the Director of Medical Services), and of four years in the Reserve of Air Force officers. The periods of service on the active list are under review. Selections for permanent commissions will be made from officers holding short-service commissions, and those who are not selected will be transferred to the Reserve at the expiration of their period of service on the active list.

Short-service officers who are approved for permanent commissions, but for whom there are not vacancies in the Royal Air Force Medical Service, may, under certain conditions, be considered for transfer to the Royal Army Medical Corps, counting their time served in the Royal Air Force towards increments of pay and retired pay in the Royal Army Medical Corps.

Officers who have been selected for permanent commissions may be granted leave for a period not exceeding nine months for post-graduate study in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such leave will be granted during the first six years of permanent service, and during such leave officers will receive full pay and allowances.

New entrants for the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will be promoted to the rank of Squadron Leader after 10 years' total service. Accelerated promotion may be carried out, in a limited number of cases, of officers who show exceptional ability after the completion of eight years' service. Promotion within establishment to the rank of Wing Commander will be by selection at any period after 16 years' total service, and to that of Group Captain by selection at any period after 22 years' service.

There will be no competitive examination on entry; candidates must be under 28 years of age, British subjects, the sons of British subjects, and of pure European descent, be nominated by the Dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce—

1. Birth certificate.
2. Medical registration certificate.
3. A declaration containing the following information:—

(a) Age and place of birth.

(b) That he is a British subject and the son of British subjects, and of pure European descent.

(c) That he is ready to engage for general service at home or abroad as required.

(d) The qualifications he is possessed of, and what medical or other appointments he has held (if any).

(e) That he is willing to fly whenever called upon to do so.

Each candidate will be required, before acceptance, to pass a medical examination to ensure that he labours under no constitutional or mental disease or diseases or weakness, nor any imperfection or disability which may interefere with the efficient discharge of the duties of a medical officer in any climate, in peace or war.

An officer granted a short-service commission who, at the time of application for such commission held or was about to hold a resident appointment in a recognised civil hospital, may be seconded for the period not exceeding one year from the date of the commission during which he shall hold such appointment. Whilst seconded he will not receive pay from Air Ministry funds, but the period of secondment will otherwise count as service in the Royal Air Force, provided that he will be required to serve for a minimum period of two years on the active list from the date on which he ceases to be so seconded.

Uniform and Equipment.

Medical officers will be required to provide themselves with the uniform of their rank and with the distinguishing badge of the Royal Air Force Medical Service. They will be required to provide themselves with service dress and mess dress. The provision of full dress is entirely optional at present.

An allowance of £50 will be made towards the cost of uniform for officers who have not previously held commissions in the Royal Navy, the Army, the Indian Army, the Royal Marines, or the Royal Air Force, or any of the auxiliaries of these forces. An allowance of £25 will be made for officers with previous commissioned service in the Royal Navy, the Army, the Indian Army, the Royal Marines, or any of the auxiliaries of these forces, but not in the Royal Air Force or its auxiliaries.

The rates of pay are as shown in Table I.

The standard scale of retired pay for Group Captains and lower ranks is given in the following table:—

TABLE II.

Age.	Service counting for retired pay.	Standard rate of retired pay.	Addition for each extra year of service.*	Reduction for each deficient year of service.*
		£	£	£
55	24	790	22	15
54	24	765	22	15
53	23	742	22	15
52	23	720	22	15
51	22	697	22	15
50	22	675	15	15
49	21	637	15	15
48	21	600	15	15
47	20	562	15	15
46	20	525	15	15
45	19	487	15	15
44	19	450	15	15
43	18	412	15	15
42	18	375	15	15
41	17	337	15	15
40	17	300	15	15

* Limited to five years.

Group Captains retire at 55; maximum retired pay £900.
Wing Commanders retire at 51; maximum retired pay £600.
Squadron Leaders retire at 48; maximum retired pay £500.

There will be a minimum qualifying period for retired pay of 20 years.

The rates of retired pay given above (including the maximum rates) are standard rates which will be subject to revision as stated in paragraph 2 under Table I. The revision will apply to all retired pay which is being drawn at the date of revision as well as to subsequent awards.

Gratuities.

Short-service officers will receive gratuities on the scale of £100 for each of the first two complete years of service, and £150 for each of the third and fourth complete years. These gratuities will not be payable to officers granted permanent commissions, but the period of service under the short-service commission will count for retired pay.

Medical officers holding permanent commissions may, at the discretion of the Air Council, be allowed to withdraw from the Service after ten years' service with a gratuity of £1250 or after 16 years with a gratuity of £2000 in lieu of retired pay.

Allowances.

The usual allowances will be payable to medical officers under the same conditions as to officers of other branches of the Royal Air Force.

In addition to a chief medical officer (£800 a year, rising to £1000), a medical superintendent, Colonial Hospital (£650–£900, inclusive of allowances as medical officer of health and officer in charge of the Medical School), and a medical superintendent, Makogai Leper Asylum (£600 rising to £800), there are in Fiji 11 medical officers, five of whom are also district commissioners. The salaries in Fiji are subject to temporary increases, the rate of bonus at the present time being 15 per cent. of the salary with the addition of £22 10*s.*

The staff in the British Solomon Islands Protectorate consists of one senior medical officer (£650 rising to £750) and two medical officers (£550 rising to £650). In the Gilbert and Ellice Islands Colony there is one medical officer in charge (£650 rising to £750). Officers may be transferred from Fiji to the Western Pacific at the discretion of the Secretary of State.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £900, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer, who is allowed consulting practice only) and receiving 2*s.* *per diem* forage allowance. There is also a medical officer of health on £600, rising by £20 increments to £720 without private practice; these are the only medical appointments in the island which are open to English candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £750, and private practice. There are also two assistant surgeons with a salary of £720 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £300 per annum, £20 fees as health officer, and £30 horse allowance. Private practice is allowed. A temporary bonus of 20 per cent. is at present being paid to the colonial surgeon, who further receives an allowance of £67 per annum from the Administration. The assistant colonial surgeon at present receives £550 a year and a horse allowance, but the salary may be revised on the occurrence of a vacancy. No private practice without special permission of the Governor.

Falkland Islands.—There are two appointments. The colonial surgeon is paid at the rate of £600 per annum, with free furnished quarters. The assistant colonial surgeon is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters. Private practice is shared between the colonial surgeon and the assistant colonial surgeon. The office of colonial surgeon is pensionable.

Palestine.[2]—The grades and salaries of superior appointments in the Department of Health are: Director, £E1100–50–1400, plus £E100 expatriation allowance. Deputy director, assistant director (laboratory section), and senior medical officer (Jerusalem-Jaffa district) £E800–50–1100 plus £E100 expatriation allowance. Deputy assistant director, chemical analyst, three senior medical officers, and medical officer (Jerusalem-Jaffa district) £E550–25–750 plus £E50 expatriation allowance. The remainder of the staff is recruited locally. The salaries of the two highest grades will be reduced as vacancies occur.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa on full salary is granted in the normal case after a tour of residential service (of not less than 20 and not usually more than 30 months) to an amount of five days for each completed month of residence (or 2½ days when for any reason the officer is not returning to East Africa) exclusive of the periods of the voyages to and fro, for which full pay is also given. Officers serving in Uganda, Zanzibar, and the Tanganyika Territory, or in certain stations in Kenya and Nyasaland, are allowed six (or three) days' leave in respect of each month of service instead of five (or 2½) days' leave respectively. In Somaliland special leave regulations exist which provide for an officer taking leave after a shorter tour of service than in other parts of East Africa. Free first-class passages are provided for the officer on first appointment and on leave.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Up to the end of 1923 free passages are granted on first appointment and on leave, but the continuance of this privilege beyond that date is uncertain; but free passages on first appointment or transfer are granted permanently for officers with salary under £800 per annum.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of six years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months [3] in any two years. In British Guiana officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay leave may be taken in addition to six months' full-pay leave.

On first appointment an officer whose salary and fees together do not exceed £800 a year will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—*East Africa.*—Officers on the pensionable establishment retire on attaining the age of 50 years or after 20 years' East African service, whichever is earlier; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-sixtieth of pensionable emoluments—i.e., salary and value of free quarters[4]—at the time of retirement, two years' service being reckoned as three years for this purpose, subject to an average of emoluments for the last two years before retirement instead of the actual emoluments at the time of retirement being taken as the basis for calculation in certain circumstances.

Other Colonies.—In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he

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[2] £1 Egyptian (of 100 piastres) is equivalent to £1 0s. 6d. sterling.

[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

[4] The value of free quarters for pension purposes is normally taken as 15 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement; but as a special temporary concession it will be taken as 30 per cent. of such salary in the cases of officers retiring on or after Jan. 1st, 1922. This arrangement will be liable to review after it has been in force for two years.

Bacteriologist, £900–50–1000; Assistant Bacteriologist, same scale as Medical Officer.

Nyasaland Protectorate: Principal Medical Officer, £1000. Senior Medical Officer, £800–25–900; Sanitation Officer, £800–25–900.

Zanzibar Protectorate: Principal Medical Officer, £1000; Senior Medical Officer of Health, £800–25–900.

Somaliland Protectorate: Senior Medical Officer, £800–25–900.

Tanganyika Territory: Principal Medical Officer, £1200; Deputy Principal Medical Officer, £1000; Senior Sanitary Officer, £1000; Director of Laboratory, Dar-es-Salaam, £800–25–900; Senior Medical Officers, £800–25–900.

The medical officers of health are usually selected from the medical officers in the permanent establishment. They receive special non-pensionable allowances of £50 or £100 a year according to station.

ASIA.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: $440 per mensem, rising to $480 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to $500 per mensem, and thence by annual increments of $25 per mensem to $800 per mensem, with a strict efficiency bar at $600 per mensem. This scale of salaries has been fixed on the supposition that medical officers join the service at about the age of 27. Above the concluding figure of $800 per mensem there are certain higher appointments as follows: Principal Civil Medical Officer, Straits Settlements, and Principal Medical Officer, Federated Malay States, $1200 per mensem. Class A: seven posts at $1050 per mensem. Class B: nine posts at $850, rising by $30 to $1000 per mensem.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed. They may, however, do, and receive fees for, consultative work, under conditions approved by the Government. Information about general conditions in Malaya is obtainable from the Malay States Information Agency, 88, Cannon-street, E.C. 4.

Seychelles.—The chief medical officer receives Rs.6000 and Rs.300 in fees. There are two assistant Government medical officers, one receiving Rs.5500 and Rs.500 house allowance, and one receiving Rs.5000. A small permanent increase of 5 per cent. on these salaries has been given as from Jan. 1st, 1921.

Hong-Kong.—The present establishment of the medical department is: principal civil medical officer, £1000–£50–£1200; five medical officers, £600–£25–£1000; health officer of the port, £600–£25–£1000; second health officer of the port, £600–£25–£1000; bacteriologist, £700–£25–£1000. A temporary allowance on a scale varying with the sterling exchange value of the dollar is at present payable. Salaries are converted locally at the rate of 2*s.* = $1. Free quarters are not provided, but in certain instances a rent allowance is paid by the Government.

AMERICA.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000–£1200 per annum, with consulting practice; one bacteriologist and pathologist, £450–£700 (increment £50), with £50 allowance in lieu of fees; 34 medical officers at £500–£25–£700. Some of the senior posts also carry duty allowances (varying from £50 to £300 per annum) and quarters. All the junior appointments in which private practice is not allowed carry duty allowances. Private practice is allowed in certain cases.

Trinidad and Tobago.—In Trinidad and Tobago there are over 40 appointments. Under the terms of the Ordinance regulating the medical service, officers are appointed in the first instance on two years' probation as supernumeraries and are eligible for appointment as Government medical officers at the end of this period. Supernumeraries receive a salary of £400 per annum with furnished quarters, and are usually attached to the Government hospital. Government medical officers receive salary at the rate of £400 per annum with annual increments of £25 accruing from the date of first appointment as supernumerary medical officers, until reaching the maximum of £600. Most are employed as district medical officers, with private practice, a residence or a rent allowance of £50, a horse allowance or motor allowance averaging £110 (except in one district). Officers employed in institution work receive allowances in lieu of private practice varying from £50 (and furnished quarters) to £300. In no case therefore do the emoluments on first appointment amount to less than £550 a year and furnished quarters. In a few districts a system has been introduced by which the work is performed by private practitioners under temporary contracts. There is good scope for private practice in all medical districts. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent).—There are over 25 appointments. The colonial surgeon, Grenada, receives £650–£800. The chief medical Officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government vary from £400–£500, and with allowances in certain cases. The Governor has the power to transfer a medical officer from one island to another at his discretion. The appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are of the same nature as in the Windward Islands and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary varying from £312 to £400, according to station, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands, and in certain districts may be required to perform magisterial duties. The medical officers receive fees for successful vaccinations, post-mortem examinations, attendance and giving evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also as a rule, allowed private practice. The chief medical officer, St. Kitts, receives £700–£25–£750 without private practice.

British Honduras.—There are seven medical appointments (besides the principal post of colonial surgeon) at a salary of $2430 per annum. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is approximately the same as that of the United States dollar.

OTHER OVERSEAS APPOINTMENTS.

Fiji and the Western Pacific.—In Fiji the Government medical officers receive a salary of £400, rising by annual increments of £25 to £600, with partly furnished quarters, or a house allowance of £50. In some districts a medical officer is also a district commissioner, with an additional allowance of £150. They are allowed private practice, on the understanding that their official duties are not neglected. Private practice, however, cannot be guaranteed, and in most districts it is very small in amount. Where no private practice exists, a duty allowance of £50 is granted. They are required either to take charge of hospitals or of districts, at the discretion of the authorities. The posts are pensionable.

In addition to a chief medical officer (£800 a year, rising to £1000), a medical superintendent, Colonial Hospital (£650–£900, inclusive of allowances as medical officer of health and officer in charge of the Medical School), and a medical superintendent, Makogai Leper Asylum (£600 rising to £800), there are in Fiji 11 medical officers, five of whom are also district commissioners. The salaries in Fiji are subject to temporary increases, the rate of bonus at the present time being 15 per cent. of the salary with the addition of £22 10*s*.

The staff in the British Solomon Islands Protectorate consists of one senior medical officer (£650 rising to £750) and two medical officers (£550 rising to £650). In the Gilbert and Ellice Islands Colony there is one medical officer in charge (£650 rising to £750). Officers may be transferred from Fiji to the Western Pacific at the discretion of the Secretary of State.

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Palestine.[2]—The grades and salaries of superior appointments in the Department of Health are: Director, £E1100–50–1400, plus £E100 expatriation allowance. Deputy director, assistant director (laboratory section), and senior medical officer (Jerusalem-Jaffa district) £E800–50–1100 plus £E100 expatriation allowance. Deputy assistant director, chemical analyst, three senior medical officers, and medical officer (Jerusalem-Jaffa district) £E550–25–750 plus £E50 expatriation allowance. The remainder of the staff is recruited locally. The salaries of the two highest grades will be reduced as vacancies occur.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa on full salary is granted in the normal case after a tour of residential service (of not less than 20 and not usually more than 30 months) to an amount of five days for each completed month of residence (or 2½ days when for any reason the officer is not returning to East Africa) exclusive of the periods of the voyages to and fro, for which full pay is also given. Officers serving in Uganda, Zanzibar, and the Tanganyika Territory, or in certain stations in Kenya and Nyasaland, are allowed six (or three) days' leave in respect of each month of service instead of five (or 2½) days' leave respectively. In Somaliland special leave regulations exist which provide for an officer taking leave after a shorter tour of service than in other parts of East Africa. Free first-class passages are provided for the officer on first appointment and on leave.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Up to the end of 1923 free passages are granted on first appointment and on leave, but the continuance of this privilege beyond that date is uncertain; but free passages on first appointment or transfer are granted permanently for officers with salary under £800 per annum.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of six years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months[3] in any two years. In British Guiana officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay leave may be taken in addition to six months' full-pay leave.

On first appointment an officer whose salary and fees together do not exceed £800 a year will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—East Africa.—Officers on the pensionable establishment retire on attaining the age of 50 years or after 20 years' East African service, whichever is earlier; but they may be retained in the service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-sixtieth of pensionable emoluments—i.e., salary and value of free quarters[4]—at the time of retirement, two years' service being reckoned as three years for this purpose, subject to an average of emoluments for the last two years before retirement instead of the actual emoluments at the time of retirement being taken as the basis for calculation in certain circumstances.

Other Colonies.—In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

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[2] £1 Egyptian (of 100 plastres) is equivalent to £1 0*s*. 6*d*. sterling.

[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

[4] The value of free quarters for pension purposes is normally taken as 15 per cent. of the minimum salary of the grade in which an officer is serving at the time of retirement; but as a special temporary concession it will be taken as 30 per cent. of such salary in the cases of officers retiring on or after Jan. 1st, 1922. This arrangement will be liable to review after it has been in force for two years.

WEST AFRICAN MEDICAL STAFF.

Applicants for appointment as medical officers in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government, and houses for the wives of junior medical officers are rarely available. Officers are not allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor; and permission to bring out young children will only be given in the most exceptional circumstances.

Candidates whom it is proposed to select for appointment will have to be medically examined by one of the medical advisers of the Colonial Office (or, in the case of those residing in a Colony, by a medical officer appointed by the Colonial Government), and no appointment will be made unless the candidate is declared to be physically fit for service in West Africa. Candidates are allowed to express a preference for any particular Colony or Protectorate, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony or Protectorate at the discretion of the Secretary of State. Candidates who wish to be posted to the Northern Provinces of Nigeria should be able to ride. Transfers from one Colony or Protectorate to another will be made as seldom as possible. They should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred elsewhere, as the number of such transfers is exceedingly small.

Officers of the West African Medical Staff who may be transferred to pensionable appointments under the Crown elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies in any particular case that this is unnecessary.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction for two or three months, either at the London School of Tropical Medicine, Endsleigh-gardens, Euston-square, N.W. 1, or at the Liverpool School of Tropical Medicine, University, Liverpool. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £3 a week will be paid to them monthly in arrear for this purpose. A daily allowance of 5*s.* (but no salary) will be paid to each candidate monthly in arrear during the course, and may be continued subsequently up to the date of embarkation. He will be bound to refund them (1) if he declines to accept an appointment in any of the Colonies or Protectorates for which he may be selected by the Secretary of State; (2) if he fails to obtain a certificate in regard to progress and efficiency, or (3) if he relinquishes the West African Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of the date of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United Kingdom, and, if the officer is returning to West Africa for further service, the time necessarily taken on the journey from the United Kingdom to the Colony. Vacation leave may be granted without any special grounds after 18 consecutive calendar months of residential service in West Africa. An officer will not be required to serve a tour of more than 24 consecutive calendar months' residential service except in special circumstances; and the Governor may grant vacation leave to any officer at any time after he has completed 12 consecutive calendar months' residential service. Vacation leave on full salary may also be granted to an officer if he is invalided from West Africa after less than 12 consecutive calendar months' residential service, and sick leave on full salary may be granted for any period not exceeding six calendar months.

Appointments and Salaries.—The Medical Services of the West African Colonies and Protectorates—namely, the Gambia, Sierra Leone, the Gold Coast (including Ashanti and the Northern Territories), and Nigeria (Southern and Northern Provinces)—form one service under the name of the West African Medical Staff. All the medical officers for the service are selected by the Secretary of State for the Colonies, and are on one list for employment and promotion. The grades and emoluments of the Staff are at present as follows:—

The Director of the Medical and Sanitary Service, Nigeria, receives a salary of £1800 a year, with a duty allowance at the rate of £360 a year. The Director of Medical and Sanitary Service in the Gold Coast receives a salary of £1600 a year, with a duty allowance at the rate of £320 a year. The Director of Medical and Sanitary Service in Sierra Leone receives a salary of £1400 a year, with a duty allowance at the rate of £280 a year. The Deputy Director of Medical and Sanitary Service, Nigeria, and the Deputy Director of Sanitary Service, Nigeria, receive salaries of £1500 a year, with duty allowances at the rate of £300 a year. The Deputy Director of Medical and Sanitary Service, Gold Coast, receives a salary of £1400 a year, with duty allowance at the rate of £280 a year. Assistant Directors Medical Service: There are nine appointments on this grade, six in Nigeria, two in the Gold Coast, and one (with the title of Deputy Director Medical Service) in Sierra Leone. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. The Assistant Director of Sanitary Service, Nigeria, the Deputy Director of Sanitary Service in the Gold Coast and the Deputy Director of Sanitary Service in Sierra Leone receive salary at the rate of £1300 a year, with duty allowance at the rate of £260 a year. Specialists: The number of these appointments is not fixed, officers of outstanding professional merit being eligible for appointment. The salary is at the rate of £1300 a year, with duty allowance at the rate of £260 a year. After five years' approved service as such, the specialist officer is eligible to receive a salary at the rate of £1400 a year, with duty allowance at the rate of £280 a year. There are at present four officers appointed specialists in Nigeria and two in the Gold Coast. Senior Medical Officer: There are twenty appointments of this grade, with salary at the rate of £1000 a year, rising by annual increments of £50 to £1150 a year, and seniority allowance at the rate of £100 a year. The Senior Medical Officer, Gambia, is allowed "staff pay" of £150 a year, in addition to duty allowance, but he is debarred from private practice. Senior Sanitary Officer: There are six appointments of this grade, with salary at the rate of £1050 a year, rising by annual increments of £50 to £1200 a year, and a duty allowance at the rate of £210 a year. Medical Officer: The salary attached to this grade is at the rate of £660 a year, rising by annual increments of £30 to £720 a year. Then, if confirmed in the appointment, £720 a year, rising by annual increments of £40 to £960, with seniority allowance at the rate of £72 a year. Before passing £800, medical officers are required to take a special course of study for three months. If they obtain satisfactory certificates at the end of the course they draw their further increments up to £960 a year.

A medical officer who has served for three years on the maximum salary of this scale (£960) without obtaining promotion is eligible, if recommended by the Governor, to be placed on the scale £1000–£50–£1150, with £100 seniority allowance (as for Senior Medical Officers).

Special Appointments.—The director of the Medical Research Institute, Lagos, and the pathologist, Accra, receive a salary of £1300 a year, with a duty allowance of £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. Salary at the rate of £800 a year, rising by annual increments of £40 to £960 a year, is attached to about ten posts (those of assistant at the Medical Research Institute, Lagos, and medical officers of health at various places), irrespective of the seniority of the officer holding the appointment. In addition to the seniority allowance (£72 a year), staff pay at the rate of £150 a year is also attached to these posts; and the holder of the appointment draws half of the staff pay during leave of absence, the remainder being drawn by his locum tenens. The holders of these appointments are not allowed private practice.

Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of an officer during the period of employment qualifying for increment is approved.

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at the majority of stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement from the service are granted in accordance with the law and regulations of each individual Colony.

Fuller information can be obtained from the Private Secretary, Colonial Office, Whitehall, London, S.W. 1.

SPECIAL DIPLOMAS.

DIPLOMA IN TROPICAL MEDICINE.

ALTHOUGH a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Tropical Medicine, 5, Endsleigh-gardens, London, N.W. 1 (founded in 1899), which is a school of the University of London in the Faculty of Medicine.

University of Cambridge.—The examination for the Diploma in Tropical Medicine and Hygiene is divided into two parts. Part I. is held in Cambridge in April and Part II. in July in London. Candidates for Part I. are examined under the same regulations and in the same subjects as candidates for the Diploma in Public Health, but any qualification in medicine or surgery recognised by the proper authority of any country outside the British Dominions may be recognised. The subjects for Part II. are Medicine, Surgery, and Hygiene in their relation to Tropical Disease.

The examination will be partly in writing, partly oral, and partly practical or clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment). Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma (D.T.M. & H.) testifying to his knowledge and skill in tropical medicine and hygiene.

The fee for each part of the examination is £10 10s., and applications should be addressed to Mr. J. E. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—The M.D. degree may be taken in tropical medicine at an examination held twice annually, for which a thesis may be submitted.

University of Liverpool.—The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (*a*) Tropical Pathology, Parasitology and Entomology; (*b*) Tropical and Applied Bacteriology; (*c*) Tropical Hygiene and Sanitation; (*d*) Tropical Medicine, including Ætiology, Symptoms, Diagnosis, and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. The fee for the full course of instruction is £21, with an extra charge of 10*s.* 6*d.* for the use of a microscope if required. Applications should be made to the Dean of the Medical Faculty, University of Liverpool. Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The diploma of D.T.M. & H. Eng. is awarded on the results of an examination held thrice yearly in January, April, and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than three months, (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Fee for admission to the examination, £9 9*s.*, 14 days' notice of entry to the Secretary, Examination Hall, Queen-square, London, W.C. 1.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

THE Universities of Cambridge, London, Durham, Leeds, Manchester, and Edinburgh, and the Conjoint Board of the R.C.P. Lond. and R.C.S. Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies.

In London, courses of instruction for the Diploma in Psychological Medicine are given at the Maudsley Hospital, Denmark Hill, which has recently been definitely recognised as a school of the University of London. The course consists of two parts, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge. The fee for the whole course (Parts I. and II.) is 15 guineas, or for either part separately 10 guineas.

Appointments as clinical assistants are obtainable at the Maudsley Hospital. The holding of such appointments for varying periods satisfies the requirements of the different examining bodies in respect of practical study of mental disorders. The appointments and other facilities for clinical experience are open to qualified medical practitioners apart from the courses of instruction. Inquiries as to lectures should be addressed to the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E. 5; and as to clinical facilities, to the Medical Superintendent at the same address.

A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various Universities, is held at Bethlem Royal Hospital twice annually, during the spring and autumn. The fee for the full course is 15 guineas; for Part A separately 10 guineas, and for Part B separately 10 guineas. Communications should be addressed to the Physician-Superintendent, Bethlem Royal Hospital, London, S.E. 1. In addition clinical instruction in psychological medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 o'clock. The fee for post-graduates is 5 guineas for three months' attendance, but a reduction is made to those who attend the diploma course.

DIPLOMA IN OPHTHALMIC MEDICINE.

SPECIAL diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.—The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in July, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course. Further information regarding these requirements may be obtained from the Dean of the School of Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in January and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable qualification. Fee for admission to each part, £6 6*s.*

DIPLOMA IN TUBERCULOUS DISEASES.

A DIPLOMA in Tuberculous Diseases is given by the University of Wales. Candidates must possess a medical qualification registrable for practice in Great Britain and Ireland, and be not less than 25 years of age, and either (Category A) have held, for a period of not less than five years, whole-time appointments for work in tuberculosis; or (Category B) have held a registrable qualification to practise for at least one year, and presented (*a*) a certificate of satisfactory pursuance of a course of consecutive post-graduate study of the clinical and epidemiological aspects of tuberculosis of six months' duration at a recognised university, medical school, or hospital where such a course is given; or, alternatively, a certificate of one year's post-graduate work as a whole-time member of the staff of a tuberculosis hospital, sanatorium, or dispensary approved by the Ministry of Health, signed by the representative of the authorities for whom the work was performed or by the administrative medical officer concerned; (*b*) a certificate of satisfactory pursuance of a course of consecutive post-graduate practical study of the Pathology and Bacteriology of Tuberculosis of three months' duration at a tuberculosis laboratory or a recognised general laboratory where such a course is given; (*c*) a certificate of three months' satisfactory attendance at a tuberculosis institute or dispensary. The courses may be taken concurrently.

The examination is divided into two parts. An examination in each part will be held annually in the first week of July. The fee for examination is £10 10*s.* Applications should be made to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th.

DIPLOMA IN RADIOLOGY.

IN June, 1919, the University of Cambridge instituted a Diploma in Medical Radiology and Electrology to be taken by medical graduates after a course of study extending over a period of six months or more. The lecture course in Part I. consists of physics and electro-technics with photography; in Part II. of radiology and electrology—in each case with special reference to diagnosis and treatment. Six months' clinical experience is required in the electrical department of a hospital recognised by the committee for this purpose. Lecture courses are arranged twice a year alternately in Cambridge and in London. Candidates for the Cambridge course spend three months in Cambridge and the remainder in London or elsewhere. The next London course begins Oct. 1st, and the next Cambridge course Jan. 7th. Application to the Secretary, Dr. Shillington Scales, Medical Schools, Cambridge.

DIPLOMA IN PUBLIC HEALTH.

As usual we include in the Students' Number of THE LANCET an epitome of the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council from 1902 to 1922. The new regulations, which came into force on Jan. 1st last, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

Conjoint Board of the R.C.P. Lond. and R.C.S. Eng.—New regulations came into force on Jan. 1st, 1924, which apply to all candidates who have not commenced bonâ-fide study of Public Health in accordance with the above regulations before that date. They are as follows: The Examination consists of two Parts. Part I. will be held in the months of January, April, and June, and Part II. in the months of January, April, and July in each year. Candidates may enter for Parts I. and II. separately or at the same time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious Diseases, Food Inspection, and Inspection of selected

Premises. The Fee for admission to each Part of the Examination, which must be paid three days before that part commences, is £10 10*s*., except in the case of Candidates who possess the Licence, Membership, or Fellowship of the Royal College of Physicians of London, or the Membership or Fellowship of the Royal College of Surgeons of England, who will be required to pay £6 6*s*. only for each part. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next Examination on payment of the same Fees. Candidates intending to present themselves for either part of the Examination must give 14 days' notice in writing to the Secretary, at the Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

Candidates will be admissible to Examination in Part I. on producing evidence :—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended during a period of not less than five months at an Institution recognised by the Examining Board in England, practical instruction in (*a*) Bacteriology and Parasitology (including Medical Entomology) especially in their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (*b*) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical laboratory work. (*c*) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence :—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects :—(*a*) The Principles of Public Health and Sanitation for not less than 30 hours; (*b*) Epidemiology and Vital Statistics for not less than 20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours; (*d*) Sanitary Construction and Planning during not less than 10 hours.

3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received instruction in the methods of administration. This course must include 30 daily attendances of not less than two hours in each week.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to: (*a*) Maternity and Child Welfare Service; (*b*) Health Service for children of school age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—An examination, conducted partly in writing, partly vivâ voce, and in each subject partly practical, is held in Michaelmas and in Trinity Term in the following subjects :—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately; but Part I. must be passed either before or at the same examination as Part II. The fee for admission to the examination is £10 for each part. Successful candidates are entitled to receive the Diploma in Public Health.

The First Part of the examination will comprise (*a*) written papers of three hours each in (i.) Chemistry and Physics, and (ii.) Pathology and Bacteriology; (*b*) a three hours' practical and vivâ voce examination in Chemistry and Physics; (*c*) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

The Second Part of the Examination will consist of the following parts :—(*a*) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health); (*b*) a practical and vivâ voce examination in General Hygiene; and (*c*) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce certificates (1) of Laboratory Work in Chemistry as applied to Hygiene, and (2) of having had Practical Instruction in Bacteriology, and the Pathology of the Diseases of Animals transmissible to Man.

Candidates in Part II. will produce the following further certificates: (3) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration.

All the above degrees are now open to Women Students, and particulars of Scholarships, &c., may be obtained from the Principals of the various Ladies' Colleges. The names of candidates for the Diploma in Public Health must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford. Applications for any further information should be addressed to the Dean, Department of Medicine, Museum, Oxford.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be oral and practical, as well as in writing. Candidates may present themselves for either part separately or for both together at their option; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) Part I. of the examination; or (2) Part II. of the examination. Every candidate will be required to pay a fee of £10 10*s*. before admission or readmission to *either part* of the examination. Candidates must before admission to either part of the examination produce evidence of having satisfied the regulations applicable to Part I. and Part II.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene, Chemistry, &c., and on Bacteriology and Parasitology. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital, and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology. There are also special courses in Vital Statistics, Tuberculosis Service, Venereal Diseases Service, Industrial Hygiene, Maternity and Child Welfare. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England.

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Public Health Chemical Laboratory, Cambridge.

University of London.—Candidates for the M.D. degree may offer State medicine as a subject in which to graduate. They must send to the Academic

Registrar with their forms of entry certificates (i.) of having, subsequently to having obtained a registrable qualification to practise Medicine, attended a course of practical instruction in a laboratory or laboratories, British or foreign, approved by the University, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught; such course to extend over a period of not less than six months and to consist of at least 240 hours, of which not more than one-half shall be devoted to practical chemistry. (ii.) *Either* of having, subsequently to having obtained a registrable qualification to practise Medicine, during six months (of which at least three months shall be distinct and separate from the above-mentioned period of laboratory instruction) been diligently engaged on not less than 60 working days in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a person recognised by the University as entitled to grant certificates. *Or* of having held for a period of not less than three years an appointment as Medical Officer of Health of a Sanitary District within the British Dominions, and having a population of not less than 15,000. (iii.) Of having, subsequently to having obtained a registrable qualification to practise Medicine, attended at least twice weekly during a period of not less than three months a practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. In connexion with this degree the various metropolitan medical schools hold regular classes under teachers of Public Health and Sanitary Science, such instruction being also used to obtain the various diplomas of other Universities and of those Royal Corporations which grant them.

University of Durham.—The Degree of Bachelor of Hygiene (B.Hy.) and the Diploma in Public Health (D.P.H.).—No candidate is admitted to the final examination for the Degree of B.Hy. unless he is a Bachelor of Medicine and Surgery, of not less than two years' standing, of a recognised University, and no candidate is admitted to the final examination for the D.P.H. unless he is a registered medical practitioner, of not less than two years' standing. The course of study for the B.Hy. and D.P.H. extends over a period of not less than 12 calendar months, subsequent to the attainment of a registrable qualification. Candidates for the B.Hy. must attend this course at the University of Durham; candidates for the D.P.H. may attend it at the University of Durham, or at any medical school or institution which is recognised by the University. The examination for the diploma or degree is divided into two parts. A candidate must pass in all the subjects of Part I. before being admitted to examination for Part II. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. The examination for Part I. is practical, written, and oral, and includes the following subjects: Bacteriology and Parasitology (including medical entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. Candidates are not admitted to examination for Part I. until after they have completed the prescribed courses of instruction in the subjects thereof. The examination for Part II. includes Hygiene and Sanitation (including sanitary construction), Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination is written and oral, and includes practical examinations in Infectious Diseases, Food Inspection, Inspection of Premises—Dwellings, Factories, Workshops, Schools, &c. Candidates are not admitted to examination for Part II. until after they have completed the prescribed courses of instruction in the subjects thereof.

The fee for the examination for the degree of B.Hy. is £10 10*s*. and for the degree £6 6*s*. Candidates for the degree of Doctor of Hygiene (D.Hy.) shall be Bachelors of Hygiene of two years' standing, and shall be required to satisfy the examiners that they have conducted original research in the subject of Public Health. The fee for the examination for the degree of D.Hy. is £20 and for the degree £10. The fee for the examination for the Diploma in Public Health is £10 10*s*. and for the diploma £3.

Victoria University of Manchester.—An examination in Public Health is held twice yearly. The examination is in two parts and is written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination. The fee for each part of the examination is £8 8*s*., and must be paid on or before July 1st in each year. For any subsequent examination in the same part the fee will be £4 4*s*. Every candidate who has passed both parts of the examination to the satisfaction of the examiners, and who is legally registered, will receive a Diploma in Public Health. The examination will begin about the middle of July and the middle of October in each year. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice. An examination for a Diploma in Bacteriology is held for graduates in science or medicine who have attended prescribed courses for at least one academic year; candidates must present a satisfactory thesis on an approved subject.

University of Birmingham.—The University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. The examinations will be held in the months of March and June and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5*s*. Medical Officers of the Royal Navy who have attended courses in Hygienic Chemistry, Bacteriology, and Public Health at the Naval Medical School, Greenwich, will be admitted to the examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied Chemistry and Bacteriology at the Staff College and pursued the further course of study approved by the General Medical Council.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken out at any time, and students are allowed to work daily in the laboratories. Composition fee for M.H. £40 a session, and D.P.H. £45 a course.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates must pass in Part I. before being admitted to Part II. Fees.—The fee for each part is £8 6*s*., and for any subsequent examination in the same part £4 4*s*. Instruction in Entomology and Meteorology given in the first term, and in Sanitary Chemistry nd Bacteriology in the second and third terms. ractical work under arrangement with the Leeds ity Council. Prospectus can be obtained from the cademic Sub-Dean of the Medical School.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulation. The examination is divided into two parts.

University of Wales.—Candidates for the Diploma in Public Health, the curriculum for which extends over a period of not less than twelve calendar months subsequent to the attainment of a registrable qualification, must produce evidence of having attended for not less than five months at the Welsh National School of Medicine or at an institution approved by the Court, practical instruction in Bacteriology and Parasitology, Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates must also satisfy the examiners that they have received instruction approved by the University in the Principles of Public Health and Sanitation, Epidemiology and Vital Statistics, Sanitary Law and Administration, and Sanitary Construction and Planning. The candidate must also produce evidence that he has attended for three months on the clinical practice of a hospital for infectious diseases containing not less than 100 beds, and has received therein instruction in the methods of administration, and that he has for a period of not less than six months been engaged in acquiring a practical knowledge of the duties, routine and special, of a public health administration under the supervision of a medical officer of health. The examination for the diploma is divided into two parts, Part I. and Part II., each of which extends over not less than two days. A candidate must pass in all the subjects of Part I. before being admitted to Part II. of the examination. In Part I., and also in Part II., a candidate must pass in all the specified subjects at one time. Part I. of the examination is practical, written and oral, and includes Bacteriology and Parasitology (including Medical Entomology); Chemistry and Physics, and Meteorology and Climatology in relation to Public Health. Candidates may not be admitted to Part I. of the examination until they have been certified as having pursued the prescribed courses of instruction in the subjects thereof. Part II. of the examination, which is written and oral, includes: Hygiene and Sanitation (including Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. No candidate can be admitted to Part II. of the examination until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, Surgery, and Midwifery, which qualification must be registered before admission to Part II. of the examination. An examination in each part will be held annually, in June. Notice of candidature, together with the fee of six guineas for either part of the examination, must be sent to the Registrar of the University, University Registry, Cathays Park, Cardiff, not later than May 15th.

University of Edinburgh.—Two degrees in Science in the Department of Public Health are conferred by the University of Edinburgh—viz., Bachelor of Science in Public Health and Doctor of Science in Public Health. A Diploma in Tropical Medicine and Hygiene is also granted. Candidates for the degree of B.Sc. in Public Health must be graduates in Medicine of a recognised University, and must pass two examinations, for the first of which they must, after graduation in Medicine, have worked for at least 20 hours per week during a period of not less than eight months, of which at least five consecutive months must be in the Public Health Laboratory of the University of Edinburgh and the remainder either there or in a laboratory recognised by that University; they must also have attended courses of instruction in Physics and Geology in some Scottish University. Candidates are not admitted to the Second Examination sooner than six months after having passed the First Examination, nor sooner than 18 months after having taken their degree in Medicine, and they must have attended two separate courses in Public Health in some University of the United Kingdom or in such medical school or Indian, Colonial, or Foreign University as may be approved for the purpose by Edinburgh University, each course consisting of 40 lectures at least; one of which courses shall deal with medicine and the other with engineering, each in its relation to public health. The subjects of examination include Laboratory work, Physics, Geology, Medicine in its application to Public Health, Sanitation, Sanitary Law, and Vital Statistics. Graduates who have held the degree of B.Sc. in Public Health from the University of Edinburgh for a term of five years may offer themselves for the degree of D.Sc. in Public Health in that University. They must then present a Thesis and pass an examination in Public Health. The fees are £4 4*s.* for the First and £5 5*s.* for the Second B.Sc. Examinations, and £15 15*s.* for the degree of D.Sc.

University of Aberdeen.—Every candidate for the Diploma in Public Health must be a graduate in medicine of the University of Aberdeen, or of any other University whose medical degrees are recognised as qualifying for registration by the General Medical Council of the United Kingdom. No candidate will be admitted to the Final Part of the Examination for the Diploma until after the lapse of not less than two years from the date of his obtaining a registrable qualification in Medicine, which qualification shall have been registered before such admission. The whole of the prescribed curriculum of study must be undertaken after the candidate has obtained a registrable qualification in medicine, and shall extend over not less than twelve calendar months. At least one academic term must be spent at the University of Aberdeen. Every candidate shall produce evidence of having complied with the following requirements in respect of study and training:—1. Practical instruction in the following subjects within a laboratory or laboratories approved by the University: (*a*) Bacteriology and Parasitology (including Medical Entomology), in relation to diseases of man and diseases of lower animals transmissible to man—at least 180 hours, of which not less than 150 shall be occupied in practical laboratory work; (*b*) Chemistry and Physics, in relation to Public Health—at least 90 hours, of which not less than 70 shall be occupied in practical laboratory work; (*c*) Meteorology and Climatology, in relation to Public Health—at least 10 hours; such instruction to extend over not less than five months or two academic terms. 2. A course or courses of instruction extending over not less than 80 hours dealing with: (*a*) The Principles of Public Health and Sanitation—30 hours; (*b*) Epidemiology and Vital Statistics—20 hours; (*c*) Sanitary Law and Administration (including Public Medical Services)—20 hours; (*d*) Sanitary Construction and Planning—10 hours; such course or courses to be given at an institution or by a teacher or teachers approved by the University. 3. Practical instruction, clinical and administrative, within a recognised hospital for general infectious diseases: such instruction to extend over three months, and to include 30 daily attendances of not less than two hours in each week. 4. Practical instruction and experience, during not less than six months (including attendance of at least three hours on each of sixty working days) in the duties, routine and special, of public health administration, under the supervision of a medical officer of health, who shall certify that the candidate has received from this officer or other competent medical officer, practical instruction in these duties, and also in those relating to:—(*a*) Maternity and Child Welfare Service; (*b*) Health Service for Children of School Age; (*c*) Venereal Diseases Service; (*d*) Tuberculosis Service; (*e*) Industrial Hygiene; (*f*) Inspection and Control of Food, including meat and milk. The medical officers of health recognised for this purpose by the General Medical Council are: (*a*) a medical officer of health who devotes his whole time to public health work; or (*b*) the medical officer of health of a sanitary area having a population of not less than 50,000; or (*c*) in Ireland, the medical superintendent officer of health of a county or county borough having a population of not less than 50,000. The examination for the diploma is divided into two parts, each of which extends over not less than three days. The following are the fees payable for the courses of instruction given within the University: Lecture Course or Courses, £4 4*s.*; Laboratory Instruction, £14. The examination fee is £8 8*s.*, which is payable as follows:—£4 4*s.* for Part I., and £4 4*s.* for Part II. The fees for external instruction amount approximately to £11 11*s.*

University of Glasgow.—Degree of B.Sc. in Public Health.—Candidates must be graduates in Medicine of a University of the United Kingdom, or of some other University recognised for the purpose by the University Court. Candidates must produce evidence (1) that, after they have obtained a registrable Degree in Medicine, a period of not less than two years has elapsed; (2) that, after they have obtained a registrable degree in Medicine, they have, during a period of not less than 21 calendar months, pursued the course of work and instruction prescribed, and have satisfied the examiners in the prescribed examinations. There are two examinations. Part I. includes the following subjects: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health; (iv) Higher Chemistry in relation to Public Health; (v) Physics and Geology. A candidate must pass in the subjects marked (i), (ii), and (iii) of Part I. at one examination. Part II. includes the following subjects: (vi) Hygiene and Sanitation (including Sanitary construction); (vii) Epidemiology and Infectious Diseases; (viii) Sanitary Law and Vital Statistics; (ix) Public Health Administration; (x) Applied Hygiene. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like. The examination in Applied Hygiene shall be on the selected subject professed by the candidate. A candidate must pass in the subjects marked (vi), (vii), (viii), and (ix) of Part II. at one examination. *Diploma in Public Health (D.P.H.).*—Candidates for this Diploma must be legally qualified medical practitioners who are matriculated students of the University. A period of not less than two years must elapse between the attainment by the candidate of a registrable medical qualification, and his admission to the final examination (Part II.) for the Diploma. The candidate must, during a period of not less than 12 calendar months, subsequent to his attainment of a registrable medical qualification, pursue the course of work and instruction prescribed, and pass the prescribed examinations. The examination, which is both written and oral, is divided into two parts, Part I. and Part II., each of which extends over not less than two days. No candidate is admitted to either part of the examination until he has completed the prescribed courses of instruction in the subjects of that part. No candidate is admitted to Part II. until he has passed in all the subjects of Part I., nor until after the lapse of not less than two years from the date of his obtaining a registrable medical qualification, nor unless he presents a certificate showing that his name and qualification have been duly registered in the Medical Register. Part I. includes: (i) Bacteriology and Parasitology (including Medical Entomology); (ii) Chemistry and Physics in relation to Public Health; (iii) Meteorology and Climatology in relation to Public Health. A candidate must pass in all the subjects at one examination. Part II. includes: (iv) Hygiene and Sanitation (including Sanitary Construction); (v) Epidemiology and Infectious Diseases; (vi) Sanitary Law and Vital Statistics; (vii) Public Health Administration. A candidate must pass in all the subjects at one examination. The examination for Part II. includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises, such as dwellings, factories, workshops, schools, and the like.

University of St. Andrews.—The Diploma in Public Health is open to medical graduates of a University of the United Kingdom. The examination is in two parts. (1) (*a*) Bacteriology and Parasitology; (*b*) Chemistry and Physics; (*c*) Meteorology and Climatology. (2) Hygiene and Sanitation, Epidemiology and Infectious Diseases, Sanitary Law and Vital Statistics, Public Health Administration. Before admission to the first examination the candidate must have held his medical degree for one year, and before admission to the second examination for two years. Graduates in Medicine of the University of St. Andrews may take part of all of the qualifying classes in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University or medical school recognised by the University Court, but graduates of another University must spend at least eight out of the 12 months' curriculum in St. Andrews University. A complete course is given in United College, Dundee. The examination fee for each division is £5 5*s.*

University of Dublin (Trinity College).—The Diploma in Public Health is conferred, after examination, under the following conditions. The candidate must be a registered medical practitioner and have obtained a registrable qualification at least two years before the second part of the examination. The candidate must have completed, subsequently to obtaining a registrable qualification, five months' practical instruction in a chemical and bacteriological laboratory, or laboratories, approved by the University, must have received instruction in the following subjects: The principles of public health and sanitation; epidemiology and vital statistics; sanitary law and administration (including public medical services); sanitary construction and planning, must have studied, practically, outdoor sanitary work for six months under an approved officer of health, and must have attended for three months at a fever hospital where opportunities are afforded for the study of methods of administration. A special prospectus may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

*National University of Ireland.**—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously; (*b*) shall have pursued an approved course of study in the Faculty of Medicine; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

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* No returns.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The examination will be held in two parts, in March and in June. The first part of the examination will have reference to the general principles of sanitary science and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The fee for each part is 1 guinea.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. Candidates must have attended not less than four calendar months' practical instruction in Chemistry and Bacteriology in a recognised laboratory or laboratories, must have studied outdoor sanitary work for six months under a medical officer of health or other sanitary officer; and must give evidence of attendance for three months at the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration. The examination consists of two parts, and candidates may enter for both at one period or for either separately. The First Part includes (*a*) Laboratory Work (Chemistry and Bacteriology), (*b*) Physics and Meteorology; and the Second Examination embraces (*a*) Report on Premises visited, (*b*) Examination at Fever Hospital, (*c*) Examination at Public Abattoir, (*d*) Written and Oral Examinations on Epidemiology and Endemiology, (*e*) Vital Statistics and Sanitary Law, and (*f*) Practical Sanitation. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 3 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in May and October. The published regulations provide detailed synopses of the subjects of examination, *and intimation is made that the curriculum and examination will be adjusted to meet the requirements of the regulations of the General Medical Council which came into force on Jan. 1st, 1924.* Candidates applying for Regulations should state date of commencement of curriculum. The Registrar for Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and for Glasgow Mr. Walter Hurst, 242, St. Vincent-street.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must observe the following rules: 1. A period of not less than two years shall elapse between the attainment by a candidate of a registrable qualification in Medicine, Surgery, and Midwifery and his admission to the Final Examination for a Diploma in Public Health. 2. The curriculum for a Diploma in Public Health shall extend over a period of not less than 12 calendar months subsequent to the attainment of a registrable qualification. 3. Every candidate shall produce evidence of having attended, during a period of not less than five months, at an institution approved by the Licensing Body granting the Diploma, practical instruction in—(*a*) Bacteriology and Parasitology (including Medical Entomology), especially in their relation to diseases of man, and to those diseases of the lower animals which are transmissible to man; (*b*) Chemistry and Physics in relation to Public Health; (*c*) Meteorology and Climatology in relation to Public Health. At least 180 hours must be devoted to Course (*a*), of which not less than 150 hours shall be occupied in practical Laboratory work. At least 90 hours must be devoted to Course (*b*), of which not less than 70 hours shall be occupied in practical Laboratory work. At least 10 hours must be devoted to Course (*c*). 4. Evidence of having received, during not less than 80 hours, at an institution or from teachers approved by the Licensing Body granting the Diploma, instruction in the following subjects: (*a*) The Principles of Public Health and Sanitation; (*b*) Epidemiology and Vital Statistics; (*c*) Sanitary Law and Administration (including Public Medical Services); (*d*) Sanitary Construction and Planning. 5. Evidence that he has attended for three months on the clinical practice of a recognised Hospital for Infectious Diseases. 6. Evidence that he has, during a period of not less than six months, been engaged in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a Medical Officer of Health. The examination for the Diploma is divided into two parts. The examination for Part I. includes Bacteriology and Parasitology (with Medical Entomology); Chemistry and Physics, and Meteorology and Climatology, in relation to Public Health. The examination for Part II. includes Hygiene and Sanitation (with Sanitary Construction); Epidemiology and Infectious Diseases; Sanitary Law and Vital Statistics; Public Health Administration. The examination, which is written and oral, includes practical examinations in Infectious Diseases; Food Inspection; Inspection of Premises—dwellings, factories, workshops, schools, &c.

DENTAL SURGERY.

ANYONE who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is a distinct advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available.

THE DENTAL BOARD OF THE UNITED KINGDOM.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly-constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members. The term of office of the first Board, appointed in December, 1921, ended on July 28th last, and the new Board awaits appointment. The following are the names and sources of appointment of the retiring members: Chairman of the Board: Rt. Hon. F. Dyke Acland, appointed by the Privy Council. Members of the Board: Mr. L. G. Brock, Mr. W. H. Dolamore, M.R.C.S., L.D.S., and Mr. W. H. Gilmour, M.R.C.S., L.D.S., appointed by the Minister of Health; Mr. D. M'Coig Cowan, M.P., and Mr. William Guy, F.R.C.S.E., L.D.S., appointed by the Scottish

Board of Health; Mr. James H. Stirling and Mr. Edward L. Sheridan, F.R.C.S.I., L.D.S., appointed by the Lord Lieutenant of Ireland; Mr. H. J. Waring, Sir James Hodsdon, and Sir Arthur Chance, appointed by the General Medical Council; Mr. Fred Butterfield and Mr. H. A. Robertshaw, appointed by the Privy Council. Treasurers of the Board: Mr. H. J. Waring and Mr. W. H. Dolamore.

The offices of the Board are at 44, Hallam-street, London, W. 1, adjoining the offices of the General Medical Council.

Registration of Dental Students.

The following are the General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923.

The Council recommends that, subject to such exceptions as the Council may from time to time allow, every dental student at the commencement of his studentship should be registered in the manner and under the conditions hereinafter set forth.

1. The registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and is subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence by pupilage with a registered dental practitioner.

2. Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in mechanical dentistry (see No. 3 below).

3. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school.

4. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study.

5. The necessary instruction in dental mechanics, or any part of it, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in dental mechanics to a registered practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations (see No. 3 above).

Examining Bodies in Dentistry.

The following is a list of the Examining Bodies in Dentistry which grant diplomas or degrees in this subject. The regulations for obtaining these qualifications will appear in a guide to teaching institutions in dentistry at a later date.

Royal College of Surgeons of England.—Diploma in Dental Surgery.

Royal College of Surgeons, Edinburgh.—Licence in Dental Surgery. The College also grants a higher dental diploma which is registrable in the Dentists Register as an additional qualification.

Royal Faculty of Physicians and Surgeons of Glasgow.—Licence in Dental Surgery. The curriculum, which is similar to that of Edinburgh, includes in addition dental bacteriology.

Royal College of Surgeons in Ireland.—Licence in Dental Surgery.

University of Birmingham.—Dental diploma; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Bristol.—Diploma in Dental Surgery; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Durham.—Licence in Dental Surgery; degrees of Bachelor of Dental Surgery (B.D.S.) and of Master of Dental Surgery (M.D.S.).

University of Leeds.—Diploma in Dental Surgery; degrees of Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.).

University of Liverpool.—Licence in Dental Surgery; (L.D.S.); degrees in Dental Surgery (B.D.S. and M.D.S.).

University of London.—Degree of Bachelor of Dental Surgery.

University of Manchester.—Degrees of B.D.S.; and a diploma in Dentistry.

University of Sheffield.—Degree of Bachelor of Dental Surgery; and the diploma of Licentiate in Dental Surgery.

Queen's University of Belfast.—Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery.

Teaching Institutions in Dentistry.

In addition to facilities provided by the above Universities, Colleges, and Faculties, a number of dental courses are available. In London at the Royal Dental Hospital (School of Dental Surgery), Leicester-square, at University College Hospital Dental School, and at the Dental Departments of Guy's Hospital and of the London Hospital. In the provinces at the Birmingham, Manchester, and Newcastle-on-Tyne dental hospitals. In Scotland at the Incorporated Edinburgh Dental Hospital, the Incorporated Glasgow Dental Hospital, and the Dental Department of Glasgow Royal Infirmary. In Ireland at the Incorporated Dental Hospital of Ireland, Dublin. Dental study may be commenced also at any of the following schools: Birmingham Dental Hospital, Bristol Royal Infirmary and General Hospital, Dundee Dental Hospital, Leeds Dental Hospital, Liverpool Dental Hospital, and Sheffield Royal Hospital.

The Services.

ROYAL ARMY MEDICAL CORPS.

A. E. Campbell, G. C. Phipps, K. Lumsden, J. R. A. Madgwick, and F. H. King to be Lts. on probation.

ARMY RESERVE OF OFFICERS.

Lt.-Col. and Bt. Col. C. B. Lawson, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Maj. A. C. Goodwin, having attained the age limit, is retd., and is granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

Medical News.

University of London Graduates' Association. This Association is supporting the candidature of E. G. Graham Little, M.D., F.R.C.P. Lond., in the University by-election. Dr. Little has represented the medical graduates of Convocation on the Senate continuously since 1906, and is chairman of the Council for External Students.

There is a proposal for an International Congress of Radiology to be held in London at the end of June, 1925. Secretaries of radiological societies in each country are being asked to form organising committees and to send suggestions for the programme of proceedings. The provisional committee charged with the preliminary arrangements will meet in London early in September; its members include Dr. G. W. C. Kaye, Dr. Robert Knox, Dr. Stanley Melville, Dr. E. A. Owen, Dr. Russell J. Reynolds, Dr. R. W. A. Salmond, Dr. F. Shillington Scales, Dr. S. Gilbert Scott, Dr. Walter J. Turrell, and Drs. J. E. A. Lynham and John Muir, joint secretaries. All communications should be addressed to the Secretary, International Congress of Radiology, care of the British Institute of Radiology, 32, Welbeck-street, London, W. 1.

The Brackenbury Testimonial Fund.—All contributions should be in the hands of the hon. secretaries, Dr. Harold S. Beadles and Dr. Peter Macdonald, 429, Strand, London, W.C., by August 31st at the latest. It has been decided that the presentation will be made on the evening of Oct. 15th.

Post-Graduate Medical Study in Paris.—A post-graduate course will be held at the Clinique Médicale de l'Hôtel Dieu, commencing on Sept. 15th, dealing with recent medico-chirurgical views on diseases of the alimentary canal. The course is under the direction of Prof. A. Gilbert, assisted by Prof. Maurice Villaret, and will consist of 36 meetings spread over a period of two weeks. The fee for the course is 150 francs. Further particulars and full programme may be obtained from Prof. Gilbert, at the Faculté de Médecine, Université de Paris.

Post-Graduate Medical Study in Vienna.—The fourteenth and fifteenth international post-graduate courses in medicine at the Medical Faculty of Vienna will be held respectively from Sept. 29th to Oct. 11th, and from Nov. 24th to Dec. 6th. The first course will deal with the most important medical questions of the day, with special reference to therapeutics for the practitioner, and the second course will deal with children's diseases. A full programme of these courses and information regarding further opportunities of post-graduate study at Vienna may be obtained from the Dean of the Vienna Medical Faculty, Prof. Alfred Fischel, at the University, Ring des 12. November, Vienna I.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

Monday, Sept. 1st, to Saturday, Sept. 6th.—Hospital for Diseases of the Skin, Blackfriars.—Instruction in the Out-patient Department every afternoon from 2.30 p.m. Venereal Clinic, Tuesday and Friday, from 5.30 to 7 p.m. West End Hospital for Nervous Diseases.—Each day at 5 p.m. Mon., Dr. Hildred Carlill: Tabes Dorsalis. Tues., Mr. Laming Evans: Orthopædic Treatment in Diseases of Nervous System. Wed., Mr. Lindsay Rea: The Examination of the Eye in Nervous Diseases. Thurs., Dr. Ridley Prentice: Hemiplegia and Monoplegia. Fri., Dr. Worster-Drought: Investigation of Cranial Nerve Disorders.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, Sept. 1st.—11 a.m., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 p.m., Dr. Scott Pinchin: Medical Out-patients.

Tuesday.—12 noon, Dr. Burrell: Chest Cases. 2 p.m., Mr. Sinclair: Surgical Out-patients. 2.30 p.m., Mr. Tyrrell Gray: Surgical Wards.

Wednesday.—11 a.m., Medical Registrar: Medical Wards. 2 p.m., Dr. Pernet: Skin Department. 2.30 p.m., Mr. Donald Armour: Surgical Wards.

Thursday.—10 a.m., Dr. Grainger Stewart: Neurological Department. 2 p.m., Mr. MacDonald: Genito-Urinary Department. 2 p.m., Mr. Bishop Harman: Eye Department.

Friday.—10 a.m., Mr. Dudley Buxton: Dental Department. 11 a.m., Dr. McDougal: Electrical Department. 2 p.m., Mr. Vlasto: Throat, Nose, and Ear Department.

Saturday.—9.30 a.m., Dr. Burnford: Bacterial Therapy. 10 a.m., Dr. Saunders: Medical Diseases of Children. 10 a.m., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 a.m. to 6 p.m., Saturdays, 10 a.m. to 1 p.m., In-patients, Out-patients, Operations, Special Departments.

Appointments.

Allan, Ernest, M.B., Ch.B. Edin., has been appointed Ophthalmic Surgeon to the Stanley Hospital, Liverpool.

Jardine, J., M.D. Edin., F.R.C.S. Edin., Medical Officer and Inspector of Physical Training for the Scottish Educational Department.

Murdoch, Georgina, M.B., Ch.B. Glasg., Medical Officer of Health for Oldham.

St. Thomas's Hospital: Cooke, A. M., M.B., B.Ch. Oxf., Turney, H. F., M.B., B.Ch. Oxf., Walker, E. L. G., M.R.C.S., L.R.C.P. Lond., McLean, W. W., M.R.C.S., L.R.C.P. Lond., Thwaites, W. G., M.R.C.S., L.R.C.P. Lond., Gervis, W. H., M.R.C.S., L.R.C.P. Lond., Hudson, M. W. P., M.R.C.S., L.R.C.P. Lond., and Starkey, R. S., M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists; Hope-Simpson, J. W., M.B., B.Ch. Camb., Yates, H., M.R.C.S., L.R.C.P. Lond., Creed, R. S., M.B., B.Ch. Oxf., and Berridge, W. C. M., M.R.C.S., L.R.C.P. Lond., Resident House Physicians; Briggs, T. F., M.R.C.S., L.R.C.P. Lond., Resident House Physician for Children; Jeffery, A. L. P., M.B., B.S. Lond., Walford, A. S. H., M.B., B.Ch. Camb., Webb-Peploe, M. H., M.B., B.Ch. Camb., Metcalfe, G. A., M.B., B.Ch. Camb., Resident House Surgeons; Allan, F. G., M.R.C.S., L.R.C.P. Lond., Resident Orthopædic House Surgeon; Rees, E. J., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon (Ear); Davies, D. V., M.R.C.S., L.R.C.P. Lond., Resident House Surgeon (Throat); Chadwick, S. A. R., M.R.C.S., L.R.C.P. Lond., Senior Obstetric House Physician; Weaver-Adams, E. R., M.R.C.S., L.R.C.P. Lond., Junior Obstetric House Physician; Jones, H. V. M., M.B., B.S. Lond., Senior Ophthalmic House Surgeon; Penman, G. G., M.B., B.Ch. Camb., Junior Ophthalmic House Surgeon; Neilson, D. F. A., F.R.C.S. Eng., Cavenagh, J. B., M.B., B.Ch. Oxf., Doyle, A. F., M.R.C.S., L.R.C.P. Lond., Oliver, J. O., M.R.C.S., L.R.C.P. Lond., Barron, R. T., M.D. Lond., Facey, R. V., M.B., B.Ch. Oxf., Marsh, R. G. B., M.R.C.S., L.R.C.P. Lond., Marriner, H. L., F.R.C.S. Edin., Armanious, F. H., M.R.C.S., L.R.C.P. Lond., Lloyd-Williams, P., M.R.C.S., L.R.C.P. Lond., L.D.S., Archer, E. C., M.R.C.S., L.R.C.P. Lond., Sims, T. H., M.R.C.S., L.R.C.P. Lond., Thompson, W. D. R., M.R.C.S., L.R.C.P. Lond., Watkins-Pitchford, H. O., M.R.C.S., L.R.C.P. Lond., Wrigley, A. J., M.R.C.S., L.R.C.P. Lond., Rea, R. H. T., M.R.C.S., L.R.C.P. Lond., Thompson, J. H. G., M.R.C.S., L.R.C.P. Lond., Barrett, J. C., F.C., M.R.C.S., L.R.C.P. Lond., Pilot, R., M.R.C.S., L.R.C.P. Lond., Evans, T. L., M.R.C.S., L.R.C.P. Lond., Doyle, A. F., M.R.C.S., L.R.C.P. Lond., McKaig, G. A., M.R.C.S., L.R.C.P. Lond., Rickman, J., M.B., B.Ch. Camb., and Bauwens, P., M.R.C.S., L.R.C.P. Lond., Assistants.

Vacancies.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Milborne Port, Somerset.

A vacancy is announced under the Workmen's Compensation Acts for a Medical Referee for the County of Antrim and the County of the City of Belfast. Forms of application and scales of fees payable may be obtained from the Secretary, Ministry of Labour, 7, Upper Queen-street, Belfast.

Births, Marriages, and Deaths.

BIRTHS.

Boswell.—On August 13th, at Southborough-road, Bickley, Kent, the wife of Philip R. Boswell, M.C., M.B., B.Ch. Camb., of a son.

Bracewell.—On August 16th, at Wrentham House, Wrentham, Lowestoft, the wife of Charles H. Bracewell, M.R.C.S., L.R.C.P., of a daughter.

Peebles.—At Salterley Grange, Cheltenham, on August 20th, to Dr. and Mrs. D. J. Peebles, a daughter.

Scott.—On August 16th, at Old Market-street, Bristol, the wife of Dr. H. Hope Scott, of a son.

Woodman.—On August 21st, at 132, Hagley-road, Edgbaston, the wife of E. Musgrave Woodman, M.S., F.R.C.S., of a daughter.

MARRIAGES.

Buchanan—Godsal.—On August 14th, at the Parish Church, Hurst, Berks, John Vessie Buchanan, M.B., Ch.B., of Shaw, Lancs, to Marion Waiata, younger daughter of Edward Hugh Godsal, Great Mead, Wokingham.

Nixon—Walker.—On August 18th, at S. Crantoc, Newquay, Cornwall, John Alexander Nixon, C.M.G., M.D., F.R.C.P., to Doreen Gennifer Constantia Walker, M.R.C.S., L.R.C.P.

Smith—Thomas.—On August 2nd, at St. Mary's, Hanwell, Ernest Flavel Smith, M.B., B.S. Lond., to Neryl Eleanor Mary Thomas, only daughter of Mr. and Mrs. O. B. Thomas, of "Homeleigh," Oaklands-road, Hanwell.

DEATHS.

Burridge.—On August 17th, at a nursing home, Henry Alfred Burridge, B.A., M.B., &c., of 15, Cambalt-road, Putney, aged 57 years.

Lascelles.—On August 16th, at his residence, "Caulfield," Earlestown, Lancs, suddenly, of heart failure, John Lascelles, M.B., B.Ch., B.A.O., aged 32 years. Buried at Downpatrick August 19th, 1924.

McFarlane.—On August 17th, at King's College Hospital, Dr. F. Norman McFarlane, M.B. Edin., late of the Radcliffe Infirmary, Oxford, aged 28 years.

Pattison.—On August 21st, at Charing Cross Hospital, after a long illness, Edward Seton Pattison, L.R.C.P. Lond., M.R.C.S. Eng., in his sixty-ninth year.

Smith.—On August 16th, at Bournemouth, the result of accident, James William Smith, L.R.C.P. Lond., M.R.C.S., late of Doncaster, aged 83.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Board of Health; Mr. James H. Stirling and Mr. Edward L. Sheridan, F.R.C.S.I., L.D.S., appointed by the Lord Lieutenant of Ireland; Mr. H. J. Waring, Sir James Hodsdon, and Sir Arthur Chance, appointed by the General Medical Council; Mr. Fred Butterfield and Mr. H. A. Robertshaw, appointed by the Privy Council. Treasurers of the Board: Mr. H. J. Waring and Mr. W. H. Dolamore.

The offices of the Board are at 44, Hallam-street, London, W. 1, adjoining the offices of the General Medical Council.

REGISTRATION OF DENTAL STUDENTS.

The following are the General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923.

The Council recommends that, subject to such exceptions as the Council may from time to time allow, every dental student at the commencement of his studentship should be registered in the manner and under the conditions hereinafter set forth.

1. The registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and is subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence by pupilage with a registered dental practitioner.

2. Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in mechanical dentistry (see No. 3 below).

3. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school.

4. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study.

5. The necessary instruction in dental mechanics, or any part of it, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in dental mechanics to a registered practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations (see No. 3 above).

EXAMINING BODIES IN DENTISTRY.

The following is a list of the Examining Bodies in Dentistry which grant diplomas or degrees in this subject. The regulations for obtaining these qualifications will appear in a guide to teaching institutions in dentistry at a later date.

Royal College of Surgeons of England.—Diploma in Dental Surgery.

Royal College of Surgeons, Edinburgh.—Licence in Dental Surgery. The College also grants a higher dental diploma which is registrable in the Dentists Register as an additional qualification.

Royal Faculty of Physicians and Surgeons of Glasgow.—Licence in Dental Surgery. The curriculum, which is similar to that of Edinburgh, includes in addition dental bacteriology.

Royal College of Surgeons in Ireland.—Licence in Dental Surgery.

University of Birmingham.—Dental diploma; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Bristol.—Diploma in Dental Surgery; degrees of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.).

University of Durham.—Licence in Dental Surgery; degrees of Bachelor of Dental Surgery (B.D.S.) and of Master of Dental Surgery (M.D.S.).

University of Leeds.—Diploma in Dental Surgery; degrees of Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.).

University of Liverpool.—Licence in Dental Surgery; (L.D.S.); degrees in Dental Surgery (B.D.S. and M.D.S.).

University of London.—Degree of Bachelor of Dental Surgery.

University of Manchester.—Degrees of B.D.S.; and a diploma in Dentistry.

University of Sheffield.—Degree of Bachelor of Dental Surgery; and the diploma of Licentiate in Dental Surgery.

Queen's University of Belfast.—Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery.

TEACHING INSTITUTIONS IN DENTISTRY.

In addition to facilities provided by the above Universities, Colleges, and Faculties, a number of dental courses are available. In London at the Royal Dental Hospital (School of Dental Surgery), Leicester-square, at University College Hospital Dental School, and at the Dental Departments of Guy's Hospital and of the London Hospital. In the provinces at the Birmingham, Manchester, and Newcastle-on-Tyne dental hospitals. In Scotland at the Incorporated Edinburgh Dental Hospital, the Incorporated Glasgow Dental Hospital, and the Dental Department of Glasgow Royal Infirmary. In Ireland at the Incorporated Dental Hospital of Ireland, Dublin. Dental study may be commenced also at any of the following schools: Birmingham Dental Hospital, Bristol Royal Infirmary and General Hospital, Dundee Dental Hospital, Leeds Dental Hospital, Liverpool Dental Hospital, and Sheffield Royal Hospital.

The Services.

ROYAL ARMY MEDICAL CORPS.

A. E. Campbell, G. C. Phipps, K. Lumsden, J. R. A. Madgwick, and F. H. King to be Lts. on probation.

ARMY RESERVE OF OFFICERS.

Lt.-Col. and Bt. Col. C. B. Lawson, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Maj. A. C. Goodwin, having attained the age limit, is retd., and is granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

Medical News.

UNIVERSITY OF LONDON GRADUATES' ASSOCIATION.—This Association is supporting the candidature of E. G. Graham Little, M.D., F.R.C.P. Lond., in the University by-election. Dr. Little has represented the medical graduates of Convocation on the Senate continuously since 1906, and is chairman of the Council for External Students.

THERE is a proposal for an International Congress of Radiology to be held in London at the end of June, 1925. Secretaries of radiological societies in each country are being asked to form organising committees and to send suggestions for the programme of proceedings. The provisional committee charged with the preliminary arrangements will meet in London early in September; its members include Dr. G. W. C. Kaye, Dr. Robert Knox, Dr. Stanley Melville, Dr. E. A. Owen, Dr. Russell J. Reynolds, Dr. R. W. A. Salmond, Dr. F. Shillington Scales, Dr. S. Gilbert Scott, Dr. Walter J. Turrell, and Drs. J. E. A. Lynham and John Muir, joint secretaries. All communications should be addressed to the Secretary, International Congress of Radiology, care of the British Institute of Radiology, 32, Welbeck-street, London, W. 1.

An Address
ON THE
DIAGNOSIS OF A HEALTHY HEART.

Delivered before the Canadian Medical Association at the Annual Meeting, Ottawa, on June 19th, 1924,

BY JOHN PARKINSON, M.D., F.R.C.P.LOND.,
ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL AND PHYSICIAN-IN-CHARGE OF THE CARDIOGRAPHIC DEPARTMENT; PHYSICIAN TO OUT-PATIENTS, NATIONAL HOSPITAL FOR DISEASES OF THE HEART.

THE purpose of this address is to deal with the recognition of a healthy heart when circumstances arise which impugn its integrity. The soundness of the doctrine that diagnosis is the basis of good treatment is nowhere better exemplified than in heart disease, so that the duty is clearly imposed on us to decide first of all whether heart disease is or is not present. The general feeling of a public ignorant of the modern trend of preventive medicine is that doctors are primarily concerned with disease; but though it is our privileged misfortune to deal with disease most of our time, this should not close our eyes to the recognition of a healthy organ when its functions are merely deranged, or when other members of the corporate body cast on it clinical aspersions which are undeserved. Not only from the standpoint of rational treatment would I emphasise the prime importance of this diagnosis of a healthy heart whenever it is honestly possible, but from that of the general interests of the patient in allaying his fears and restoring his confidence. I would urge that in no branch of medicine is it more desirable to cultivate the art of deciding when disease is absent and apprehension baseless.

The responsibility of diagnosing a healthy heart should not be shirked because of the professional risk we incur of giving a good prognosis in error; and we should not seek to avoid that risk by adopting an attitude of pessimistic complacence which allows us to diagnose heart disease on mere suspicion, or to accept a second-hand diagnosis which may be brought us when, in fact, the heart may be sound. Such an attitude of playing for safety would be more justifiable were our heart cases doomed to end with the dramatic abruptness usually depicted by the novelist and imagined by the laity; a belief which is false, and founded, not on general experience, but on the distorting impression of an occasional casualty. The progress of cardiac disease as a rule gives us ample time for a revision of our prognosis. Moreover, serious heart disease is recognisable and is recognised in practice. It is rarely that a grievous malady of the heart is so elusive as to be missed, unless it be angina pectoris (which error might happen to the most experienced of us); and though a damaged heart may bear a semblance of health in this and other conditions I shall hereafter discuss, it can with a measure of certainty be caught in the net of clinical investigation.

The tendency to excessive diagnosis of heart disease was rife in the war when thousands of men were rejected as unfit for service or were invalided out of the army on the slenderest evidence of valvular disease and a mistaken notion of the ambit of cardiac manifestations. The moral of many ex-Service men has been damaged to such an extent by this wrong diagnosis of heart disease that they will never again consider themselves fit to work. The same process of indiscriminate diagnosis of cardiac disease prevails in civil practice; or if the term disease is felt to be too strong or unpalatable to the patient, in its place is substituted a cryptic phrase familiar to us as a "weak heart" or a "strained heart." I would stress the fact that whatever the temptation to do otherwise, there is seldom any justification in the realm of heart trouble for other than a preliminary statement that either there is something wrong with the heart or there is not. Whenever we use the term "heart disease" it should imply something which will either shorten the life of our patient or restrict his activities. It might seem out of place for me to remind you that an exact diagnosis only will permit us to give the complete prognosis, and that it is a point of honour with the medical profession not to cause needless alarm in giving judgment. Surely, then, we would rather discover good grounds for an assurance that the heart is healthy, thereby allaying any apprehension a patient may reasonably have, than omit to sift the evidence which at first sight might be accepted as proof of disease and premature dissolution. It is therefore my wish to examine with you the evidence which may enable us to reduce this excessive diagnosis of heart disease by clarifying our conception of what really constitutes cardiac invalidism.

ÆTIOLOGY.

I will first consider the subject in the light of the ætiology of cardiac disease. During the last century it was customary to find in the text-books a long list of causes preceding the description of any particular cardiac disease. The list could always be described as being at least comprehensive! Just as progress in neurology has led to much simplification of the causes of nervous disease and the rejection of many conjectural causes—I need only mention tabes and syphilis as an example—so from diseases of the heart have untenable causes been dropped with the advance of precise and discerning knowledge. *Acute rheumatism* still holds its terrible position as the dominant cause of heart disease in children and young adults. This is the real "heart fever." The idea has been fostered that any infection may permanently injure the heart; and diphtheria, influenza, and scarlet fever are still viewed, I am afraid, as not infrequent offenders in this respect. These, it is true, are occasionally the cause of acute heart affections, but surely the risk of contracting a permanent valvular or myocardial disease from them is very remote. When, for instance, we meet with mitral stenosis or aortic incompetence in our young patient we do not think of scarlet fever or influenza, we think of rheumatism or chorea; and if we can find no history of candid rheumatism we try to elicit an account of some illness which to our medical minds spells rheumatism. It is worth the trouble to ask as a routine about St. Vitus's dance, for chorea in cardiac essence is rheumatism. I may add that rheumatism and its kindred should not lightly be dismissed from our minds even when no history of it can be obtained. For there is a likelihood that the brunt of a veiled attack may be borne by the heart—i.e., cardiac as distinct from articular rheumatism. A history of rheumatism or chorea should therefore always make us pause before diagnosing a healthy heart.

Syphilis is the other cause of infection and permanent, nay progressive disease of the heart—the cause which should loom in our minds when confronted with a patient developing heart disease in middle life. Morbid anatomy, supported by the discovery of the spirochæte and the Wassermann reaction, tells us that syphilitic *aortitis* is one of the commonest of post-mortem findings, so we cannot but admit its clinical frequency. It was an advance in medical science when saccular aneurysm was recognised as almost exclusively syphilitic: and the time has come for us to diagnose syphilitic aortitis and its other complications, aortic incompetence, and even angina pectoris. For aortic incompetence is generally syphilitic when it makes its appearance in middle life, and angina pectoris in middle life is most often a manifestation of syphilitic infection. In fact, if we could be sure that a person in youth or middle age had never been infected by *rheumatism* or by syphilis we might almost presume that he would possess a healthy heart.

Notes, Comments, and Abstracts.

THE STUDY AND PRACTICE OF MEDICINE.

THE ADVICE OF THREE OLD MASTERS—LATHAM, SYDENHAM, AND BRIGHT.

BY R. T. WILLIAMSON, M.D. LOND.,
CONSULTING PHYSICIAN TO THE ROYAL INFIRMARY, MANCHESTER.

IT has long been the custom for senior members of the profession to give advice on the study and practice of medicine by introductory lectures at our medical schools, or by articles in the medical journals at this season of the year, and in the medical literature of the past we have a large number of excellent addresses and articles on this subject; some are so excellent and so fitting to the unchanging spirit of the profession that they are worthy of recall. The words of three old masters of medicine of the past, P. M. Latham, Sydenham, and Bright, appear especially deserving of attention in our own time.

Peter Mere Latham, the distinguished physician to St. Bartholomew's Hospital, in an introductory lecture to medical students 90 years ago, gives his views of the spirit in which medical study and work should be conducted. After stating that the *diseased human body* will be the study and care of his hearers, he makes the following impressive remarks:—

"And is it possible to feel an interest in all this? Ay, indeed it is; a greater, far greater interest than ever painter or sculptor took in the form and beauties of its health. Whence comes this interest? At first, perhaps, it seldom comes naturally: a mere sense of duty must engender it; and still, for a while, a mere sense of duty must keep it alive. Presently the quick, curious, restless spirit of science enlivens it; and then it becomes an excitement and a pleasure, and then the deliberate choice of the mind. When the interest of attending the sick has reached this point, there arises from it, or has already arisen, a ready discernment of diseases, with a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in process of time, experience forms the consummate practitioner. But does the interest of attending the sick necessarily stop here? The question may seem strange. If it has led to the readiest discernment and the highest skill, and formed the consummate practitioner, why need it go further? But what if humanity shall warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle, and invested with a moral motive, and passes into the heart. What if it be carried still further? What if religion should animate it? Why, then, happy indeed is that man whose mind, whose moral nature, and whose spiritual being, are all harmoniously engaged in the daily business of his life; with whom the same act has become his own happiness, a dispensation of mercy to his fellow-creatures and a worship of God."

The advice of Latham is still worthy of careful consideration by all teachers and students of medicine, and by examiners. His warning respecting the limitation of the time devoted to clinical work, and his advice on the importance of the student being guided to observe for himself, were never more needed than to-day. Latham insisted on the importance of "self-teaching" by the student, and the danger of over-teaching on the part of the physician: he strongly advocated strict attention to work in the hospital wards, and urged the limitation of the number of lectures in medicine and surgery. He remarks: "I have always thought that, in our schools, every mode of lecturing has been unduly exalted above clinical lecturing; and every place where knowledge is to be had, or is supposed to be had, has been unduly preferred to the bedside; and I continue to think thus." Latham laments the lack of interest in treatment shown by so many physicians, who appeared to regard pathology and diagnosis of the greatest importance, but treatment as a humbler and less worthy part of their work. Of this attitude he writes: "For this ought not to be. Medicine as it begins to touch on our higher interests, even the interest of life and death, should feel itself in alliance with higher motives than any which can be thought to help and quicken its pursuit as mere science."

Thomas Sydenham, the "father" of English clinical medicine, and who was born three hundred years ago, gives advice which is worthy of the consideration of every medical man before commencing practice. He points out: (1) The religious duty of the practice of medicine; (2) the religious obligations of medical knowledge; (3) that it is no mean or ignoble animal that he deals with; (4) "that he himself hath no exemption from the common lot . . . ." and is "liable to the same ailments and afflictions with his fellows." He then adds: "For these and like reasons let him strive to render aid to the distressed with greater care, with kindlier spirit, and with stronger fellow feeling." He allows that many in his time were not influenced by these considerations, and adds: "Some are swollen up with pride, and puffed out with the vain conceit of their knowledge: so that these matters seem small in their eyes . . . . The others either gape and grow greedy for gain, or else are borne away by the hopes of some small celebrity; in either case looking to their purses or to their fame." Sydenham was evidently an acute observer of men, as well as disease. He writes of medical practice: ". . . . For I have always thought (and not without reason) that to have published for the benefit of afflicted mortals any certain method of subduing even the slightest disease, was a matter of greater felicity than the riches of a Tantalus or a Crœsus." He also tells us: "I have weighed in a nice and scrupulous balance whether it be better to serve men or to be praised by them, and I prefer the former. And like to a brute beast is the man who has ends and aims other than the advantage of his fellow creatures."

Richard Bright, the distinguished physician to Guy's Hospital, in an introductory lecture to his students in 1832, referred to the responsibilities of the profession for which they were preparing in the following words:—

"To you affectionate children will look for the welfare of their parents; to you the anxious parent will turn for the rescue of his child; and on you the fond husband will depend for all that is dear to him in the hour of danger; to you, perhaps, may be confided the lives of numerous men led to the field of battle, or marched through unwholesome countries; to you the health and efficiency of crews destined to long and perilous navigation may be entrusted; on you the public eye is to be bent in days of plague and pestilence, for who shall now say that from such visitations even our happy climate may be free? And under all these circumstances you must be ready to give an account of what has been done, not only to those who are eagerly collected around you, but to a much more troublesome inquirer within, who will accompany you to the retirement of your closet, and with its inquisitorial voice not only ask you whether you have done your best upon the present occasion, but whether from the time you commenced your professional studies you used your utmost exertions to acquire that knowledge, which would fit you for the discharge of your duties; for it is this consciousness alone which can enable you to lie down with comfort when harassed by the occasional unsuccessful issue even of your best endeavours."

Though the advice of Latham, Sydenham, and Bright just quoted was given so long ago, and to young men who were faced by conditions and opportunities very different from those obtaining to-day, it is striking how applicable are their words to the medical student of 1924, whose elaborate curriculum is charted in this issue of THE LANCET.

VENTILATION OF SUBMARINES.

THE ventilation of submarines with special reference to service in the tropics has been carefully considered by Lieut.-Commander R. F. Jones and Lieut. G. H. Mankin, of the Medical Corps, U.S. Navy, who have reported at length their observations in *U.S. Naval Medical Bulletin* (xx., 6) for June of this year. They supply practical notes on temperature, pressure, and humidity, with remarks on the concurrent conditions of the personnel in submarines cruising on the surface and submerged. They have had large experience, and agree with earlier observers that the increase of carbonic acid (stated as rising to 2·50 per cent. in 13 hours) has little effect during submergences of less than 17 hours; they ascribe the discomforts of life in a submarine submerged rather to the effects of temperature, humidity, and the movement of the air, when they find the kata-thermometer the chief help in investigating the conditions. Their figures are sometimes a little hard to follow, for, apparently, the dry bulb is stated at 87·50° and the temperature of the space at 118° simultaneously, while saturation is claimed, though a difference of a couple of degrees between wet and dry bulbs is recorded. They are of opinion that many of the alleged hardships of submerged cruising were psychical, partly because it was noted that the appetite of the men did not suffer during a ten-hour "dive." The inconveniences are "body odors, fuel-oil smells, and emanations from batteries, from the galley, from lubricating oil." They recommend accordingly better ventilation, with straighter air trunks, more fans in each compartment, a cooling and drying system through which the air of the submerged boat shall be passed, and the separation on deck of the air inlets and outlets, to prevent used, discharged air being again drawn into the boat. Further, they ask for improved w.c. accommodation, greater opportunity for washing, more beds for the men, and ice-boxes for carrying fresh provisions. The average loss of weight in a ten-hour "dive" was about 5 lb., and the barometric pressure rose, within the steel case, about 0·3 in. per hour. Certainly the men in submarines deserve all the comfort that can be given them.

sense, and if a prominent symptom, is mainly aural in origin.

The term *syncope* may with advantage be reserved for a faint with loss of consciousness, and a similar but milder experience without loss of consciousness would be *faintness*. Common experience shows that such symptoms may under given circumstances affect anyone, so that a susceptibility to faint does not imply heart disease. To all of us have been brought children who have fainted, and who have merely on that account been suspected of heart trouble. Children with heart disease are no more liable to faint than children with septic fingers. Syncope has to do with a temporary change in the circulation, probably vagal in origin, but it almost as readily occurs in a healthy circulation as in one which is the seat of disease. There are rare exceptions, such as the syncope of Stokes-Adams syndrome, in which heart disease is the immediate cause of syncope. I am prepared to admit that a faint in later life may have a deeper significance than a faint in adolescence, but even then the cause will oftener prove to be cerebral or cerebro-vascular rather than myocardial, for a faint is not a common failing of a faulty myocardium.

Often *weakness* or exhaustion is ascribed by patients to the heart, though this organ is not responsible. We seldom find patients with heart failure coming to us complaining that they are "weak." I would stress this complaint of weakness as a very characteristic symptom of an exhausted nervous system. When we are tired we do not think of our hearts as being tired, we feel that *we* are tired, referring to ourselves as a nervous organisation. Patients who complain that they must sit down, that a sudden feeling of weakness comes over them, and who thereupon demand a tonic, are not restored by giving digitalis! Of course, this tiredness may not always be a symptom of nervous exhaustion, it may be due to an infection like pulmonary tuberculosis, with its train of toxic effects not only upon the heart as evidenced by a rapid pulse, but upon the neuromuscular system and the ductless glands, the suprarenals in particular.

The cardiac patient has a limited capacity for exertion beyond which he cannot go without distress of a particular kind. Ask the patient what stops him when he is walking, as Sir James Mackenzie advises, and he will give the clue to the cause of his condition. If he stops on account of breathlessness or pain in the chest, the cause is usually cardiovascular. In fact, I would go so far as to say that whenever a patient complains of pain about the sternum when he walks, the diagnosis of a healthy heart is out of the question. In heart disease, early or late, the symptoms are of the same class, the early case differing from the advanced in the matter of degree, not of kind. The exclusive burden in the majority is shortness of breath. Those minor symptoms of which we have spoken are shown for what they are, not truly cardiac, for they have no place even in final failure when, if cardiac, they should be most in evidence. Instead, that unique symptom—breathlessness—is in absolute control as the expression of cardiac distress.

SIGNS.

Now we come to the valuation of the signs of heart disease and at once we are met by the difficulty so often experienced in dealing with patients sent for life assurance or for acceptance into the public services. If an enlarged heart always means a diseased heart, we cannot be too careful before we say that it is enlarged. What, then, are the signs of an enlarged heart that can be misleading? The visible pulsation around the apex-beat may be more diffuse than usual, being more noticeable and even extending as a *ripple* beyond the nipple line. No assumption of enlargement can be based on this appearance, as it is often the natural result of a tachycardia and nothing else. On re-examination after an interval the reduction in pulse-rate will be observed to coincide with the disappearance of the spacious impulse. Another equivocal sign of heart enlargement is the jerky impulse so commonly felt in the ruffled hearts of nervous patients and—pensioners. But an unduly forcible beat, heaving like a billow under the hand, is a reliable sign of heart enlargement; while the combination of displacement and forcefulness makes us more certain than anything else on simple clinical examination that the heart is enlarged. I find the observer *commonly forgets that the only safe definition of* the true apex-beat is the point farthest out and farthest down where there is an impulse which lifts the finger; and through his not palpating with the hand before the finger I have seen him miss an apex-beat which has escaped to the axilla! Occasionally an unusual or double quality in the palpated impulse raises suspicion of mitral stenosis; but an undoubted presystolic thrill—like the purring of a cat, however short—must be stipulated before the *hand* can establish this diagnosis. In speaking of enlargement, I would say that the terms hypertrophy and dilatation as applied to the heart have outlived their term of clinical usefulness. These are changes mainly of interest to the pathologist; physicians may well be content to decide whether enlargement is present or not. Certainly dilatation should never be used as synonymous with failure, for the heart enlarged from disease almost always remains enlarged, and when such a heart does fail it may show little or no further increase in size.

We can no longer rely on percussion as a means of deciding the slight or moderate changes in size which would enter into the question of a healthy heart. Before hazarding the diagnosis of an enlarged heart, without a known cause for it and in the absence of symptoms, it is only prudent to make sure, by the modern development of inspection—radioscopy, or by still more accurate X ray methods now at our disposal, whether the enlargement is real or apparent.

The recognition of a healthy heart leads us next to consider the question of altered *heart sounds*. Heart sounds are weak, or, safer said, distant in so many other conditions that this sign by itself need not raise suspicion of myocardial disease. A loud first sound, especially when it is sudden, may rumour the presence of mitral stenosis, but it would be well to wait for the certainty of a presystolic murmur, as loudness of sound, like an extravagant impulse, may be another misleading effect of increased rate. A duplicated first sound is a common cause of difficulty, for it is constantly present in some healthy persons, and is a frequent accompaniment of high blood pressure. It may be extremely hard to distinguish from a short presystolic murmur.

We are all familiar with the *systolic murmurs* which are a source of trouble, and I do not want to convey any idea that their exploration is easy, for it is not. In brief, when a systolic murmur is heard, does it mean heart disease? That is a common but very important and often perplexing question which faces every physician. What I have said of the history and symptoms bears effectively on the question and provides an answer. Is there merely a systolic murmur and absolutely nothing else to suggest a cardiac lesion? If so, we should not lay too much stress upon it. A systolic murmur, whether at apex or base, if it is softly blowing and unassociated with any enlargement of the heart or with any symptom of heart disease, can in the majority of non-rheumatic cases be ignored. By way of contrast with such a sample of negation, picture the rheumatic child, pallid and breathless, with a long blowing murmur at the apex, loud enough to produce a systolic thrill over an impulse which is displaced and forcible. No one, of course, will assume that a *systolic murmur* appearing during an acute infection, like scarlet fever, or even rheumatic fever, is necessarily of organic origin and a certain precursor of permanent defect: time alone may tell.

I turn next to changes in the rate of the heart—*bradycardia and tachycardia*. We find a patient with

This matter is not so simple, however, when *age changes* in the medical sense may be assumed to have begun. In these degenerative and allied changes which milestone the march of senility, we encounter the third great cause of heart disease, and one which defies exact analysis. Among its results we have, first, disease of the arteries, with its general and localised effects, as in coronary disease; secondly, that disease of unknown origin, and not necessarily senile, in which hypertension is a prominent feature, and which is commonly a dual affection of the cardio-vascular and renal systems.

I submit that there are certain alleged causes of heart disease which need not influence our judgment in deciding as to its presence or absence. In the first place, *nervous strain* is often advanced by patients or their friends as the cause of their symptoms, supposedly cardiac. We are rather tired of the "strained heart," the "disorderly heart" of the pensioner whose nerves are in disorder, the "weak heart" of the neurasthenic; and it would be well for us to forget such hackneyed designations. *Physical strain* has too long been held as a cause of heart disease. When the heart is the seat of an infection we all would agree that exertion will injure it. With this exception, the danger of physical strain per se is now largely discounted. The heart has scarcely ever been proved to have been injured by physical strain alone, and the older reported cases will not bear modern criticism. The "athlete's heart," like the "strained heart," is a myth. It is a striking fact that among the causes even of "soldier's heart" physical exertion alone never took a place of any importance; although, of course, unwonted exertion has often revealed the presence of previously unsuspected cardiac disease.

Next we come to *toxic influences.* In searching for the cause of disease we sometimes find a definite septic focus—as, for example, in the tonsils; when we do not, we imagine a factory of toxins elsewhere, if we are so disposed. Driven by this natural desire to find the cause of an obscure case of disease, we have been induced to focus our attention on teeth, tonsils, intestinal toxæmias. But let me beg of you not to be led away by such conceptions into supposing that we have here a likely cause of chronic heart disease. When toxins which have a selective action on the heart are isolated (and abnormal thyroid products probably include such), it may be different. Toxic substances disarranging metabolism, or disturbing the balance of endocrine activities, may be a cause of general ill-health and physical imbalance without specifically affecting the heart, which only participates in the general debility or functional upheaval. Here let me say that the evidence of tobacco causing permanent disease of the heart is meagre. It is easy to show that in the early reported cases there were associated effects of syphilis or atheroma. Well-authenticated cases due to tobacco alone are very few or non-existent. Smoking has a slight though definite effect in accelerating the heart-rate and raising the blood pressure, these effects being demonstrable during the actual smoking and for some time afterwards. When palpitation is induced by smoking I would ascribe it chiefly to a heightening of the patient's sensibility to extra-systoles or to this increase in the pulse-rate, not to mention its company with indigestion. By far the most important clinical disadvantage of smoking is its tendency to induce pain in the left thoracic region, from which there may be an extension of pain or hyperæsthesia even to the left arm. This is too often unjustifiably diagnosed as "tobacco angina": but if the patient is wise he will have curtailed his smoking before his doctor has been tempted to diagnose such a terrible disease as "angina."

Speaking generally then, in youth or middle age rheumatism and syphilis are the prime causes of chronic heart disease, and in later life high blood pressure or changes in the aorta and other arteries, notably the coronary. Excluding congenital defects, ruling out acute rheumatism and chorea, and with the Wassermann reaction negative, one may say that, unless age or extracardiac disease is beginning to affect the situation, there is most reliable negative evidence to favour the diagnosis of a healthy heart.

SYMPTOMS.

I come now to the symptoms which are more or less provoked by heart disease. I am trying under these various headings to indicate the points which will enable you to diagnose the healthy heart. The first symptom of an unfavourable kind is *shortness of breath.* This is admittedly the capital and almost invariable symptom of heart disease. It is scarcely too much to say that heart disease of importance does not occur unless the breath is short on exertion. Even in angina pectoris, where pain is the characteristic feature, the breath is almost always shortened though only between attacks, not with them. We naturally exclude the non-cardiac causes of dyspnœa with which we are not now concerned. We must, however, be reasonable as regards the breathlessness we find in patients, paying regard to their age, general condition and habits, the character of their work, the opportunities they take for exertion; and we should not neglect to ascertain the lapse of efficiency and duration of the disability by asking the patient to compare his present breathlessness on a customary exertion with what it was, say, a month ago.

In the next place we have thoracic *pain.* There are some who, when they meet a patient complaining of pain in the left side of the chest not within the category of pleurisy, tend to call it angina pectoris, or, if not that, a pain arising from the heart. Now the majority of those with pain in the left side of the chest are not the subjects of heart disease. Angina pectoris is relatively uncommon, while other chest pains are common enough. You will know that aching pain below the left breast is a familiar complaint of neurasthenics and of women at the menopause. It may extend to the left scapula or above the left breast, and even as an ache or heaviness down the left arm. It is almost constant, has no direct relation to exertion, and though it may be rather sharper then, it troubles the patient when at rest and especially when tired. Again, if we find a persistent area of hyperalgesia about the left breast, so that there is tenderness on palpation, we may not take it as an indication of heart trouble. It accompanies the neuralgic pain which has been described, and which may be compared with a headache. Incidentally, let me remark that if we hear of a headache we do not presume disease of the brain; therefore if we hear of a chestache, do not let us presume disease of the heart.

When a patient complains that he feels the beating of his heart, we say that he has *palpitation.* It may be that he feels the irregularity due to extra-systoles when he goes to bed, or is distressed by the heart beating too rapidly or too forcibly on exertion or excitement. Whatever form it takes, palpitation is much oftener significant of nervous hypersensitiveness, worry or indigestion, tea or tobacco, than of cardiac disease. It may be a trivial and transient complaint, a sensory phenomenon without any disturbance of the heart's rate or rhythm, and without any sign of disease. That special form of palpitation described by subjects of paroxysmal tachycardia will later be mentioned. It is a remarkable fact that patients with a failing heart and that most irregular of all arrhythmias, auricular fibrillation, do not complain of palpitation. They have something more distressing—they cannot get their breath!

Giddiness is another symptom which is too readily considered an associate of heart disease and expressive of it. We know it may occur with extreme tachycardia, in arterio-sclerosis, and in high blood pressure, but it is quite a rare symptom in cardiac disease proper. Dizziness or vertigo in a strict history of rheumatism to prevent the fallacious diagnosis of a functional systolic murmur.

Aortic incompetence is the other valvular disease liable to be overlooked unless special care is taken, as it may begin with a quiet, low-pitched short murmur in a patient with few or no symptoms. The only safe plan of detection is to listen at the aortic area and to the left of the sternum in a quiet room, the ear being directly applied to the chest while the patient stops breathing for a moment, with the question in our mind to attune our ear: Is there an aortic diastolic murmur or not? The valvular lesion found among serving soldiers was less often mitral stenosis than aortic incompetence. A patient with mitral stenosis would be too breathless to keep on the march, but a patient with aortic incompetence might not only be able to march but to take part in vigorous sports such as boxing. The lesson for us is that with a definite aortic diastolic murmur, timed by the thumb on the carotid artery, it does not matter much about the history nor much about the symptoms, it is a case of aortic incompetence and not a case of healthy heart.

The third group of cases in which mistakes are apt to arise consists of those with hypertension or *high blood pressure.* We should be particularly alert when we encounter a class of symptom commonly considered peculiar to the menopause, to a neurosis, to obesity. High blood pressure is always a condition to bear in mind when the condition of the heart may be obscured by such concomitants. The woman suffering the manifold symptoms of the menopause may seem to be sufficiently free from indications of cardio-vascular disease until the day her blood pressure is taken. Similarly the sensations of the neurotic may be coloured by the circulatory embarrassment of high blood pressure. When people are very stout we naturally expect them to suffer from breathlessness on exertion, and we are not surprised to find them following the cardiac fashion of stopping at frequent intervals to admire the scenery! Because of this we need not assign to a fat patient the mischievous diagnosis of "fatty heart"; nor, on the other hand, assume that the circulation is healthy because obesity may seem to account for the symptoms. The point I wish to make is that hypertension may be present in obesity and explain symptoms which may wrongly be imputed to other causes. The sphygmomanometer is therefore one of the best instruments to prevent the mistaken diagnosis of a healthy heart, or rather of a healthy circulation; for it permits the proper recognition of cardiac symptoms amid the welter of misleading circumstance, and places us in touch with that very common disease hyperpiesis, or primary high blood pressure, which is responsible for so much suffering and mortality in late middle life and early old age.

In looking at the last of the common difficulties which compass the diagnosis of a healthy heart, allow me to explain why so often the *nervous system* must be taken into account to settle the question, Is our case one of a nervous or a true cardiac disease? There is some justification for patients ascribing their symptoms to the heart when they feel palpitation, especially when the conscious thumping is rapid or irregular. The thought of some heart trouble is naturally prompted when they feel pain below the left breast or feel very weak and tired. These are symptoms which suggest to the patient heart disease, and perhaps to the doctor the same preliminary belief which should as quickly as possible, if found untenable, be dismissed. Apparently functional nervous disease is something of which a patient is ashamed, and so there are substituted cardiac troubles or heart attacks, which are regarded as more honourable. But it has a bad moral effect upon us to allow the false diagnosis of cardiac disease to stand when really the patient is suffering from a neurosis, or from some condition which is the outcome of his neurotic temperament. The false diagnosis draws the attention away from the proper line of treatment, which is one not related to the heart at all, besides being unfair to the relatives, who may be imposed upon by the sufferer and led to imagine that a life is in jeopardy. When faced by the neurasthenic, though his case appears quite plausible as one of cardiac disease, we must not forget all we have learned and seen about such disease, and we must not allow him to retain improperly a diagnosis which, after all, is not even relatively one to be desired.

In conclusion, it will be seen that these difficulties need not dismay us. It is sufficient to remember angina pectoris, early valvular disease, high blood pressure, and functional nervous disease. Having considered and excluded these, we may argue that there has been no adequate cause to affect the heart in question, and it is not enlarged; no more breathlessness occurs on exertion than is natural, and no pain; it works well. We emerge from the inquiry with the diagnosis of a healthy heart, as valuable and beneficent a diagnosis as a doctor could hope to reach. The diagnosis gives the line to treatment. If the heart is healthy it requires no treatment directed to itself, but if we recognise that some other condition is operating, then we shall be well on our way towards treating it.

THE ALKALI RESERVE OF THE BLOOD IN COLIFORM INFECTIONS OF THE KIDNEY.

EFFECT IN SUCH CASES OF TREATMENT WITH ALKALIS.

By ELIZABETH H. LEPPER, O.B.E., M.B., B.S. LOND.,
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THE very marked amelioration of symptoms which occurs on treatment with alkalis in cases of acute pyelitis due to the colon bacillus suggested an investigation into the cause of this improvement. There is no doubt that in the majority of cases the temperature falls, the pain on micturition and the frequency are diminished, and the patient feels very much better; yet the amount of pus and the number of bacilli in the urine are hardly at all decreased. Under these circumstances the immediate general improvement of the patient might conceivably be due either to the successful treatment of a condition of acidosis, or to lessened irritation due to the diminished acidity of the urine.

Alkali Reserve of the Blood in Urinary Infections.

Experimental work on animals was first carried out to discover whether acidosis occurs in infections of the urinary tract with the colon bacillus. Rabbits of 1500 to 2000 g. weight were selected. Catheter specimens of the urine of these animals were cultured, and the urine also examined microscopically for pus and casts, to prove a normal condition of the urinary tract before experiments were begun. An initial estimation of the alkali reserve of the plasma was also made. 3 to 4 c.cm. of blood being collected under paraffin from an ear vein, and the plasma CO_2 estimated in a Van Slyke micro-pipette.

After these preliminary observations had been made, an emulsion of *B. coli* was injected intravenously. Thenceforth the urine, collected from metabolism cages, was examined daily for increase in albumin and for pus and casts; if these appeared. catheter specimens of urine were obtained and cultures made. Estimations of the alkali in the plasma were made within 24 hours of the injection of organisms, and repeated at intervals of a few days as long as the urine showed the presence of an infection.

Of 12 rabbits treated in this way, two died within 24 hours and three showed no infection. The remainder developed urinary infections in varying a slow rate of pulse and ask whether that is a sign of heart trouble. Not necessarily, I may say. The normal heart, free from block, may beat at quite a low rate, as low as 50 or even 40 a minute, though rarely below 50. The patient may naturally have a slow pulse-rate, may be known to have had this peculiarity for years, or the pulse may be found infrequent during convalescence after an infection or after childbirth. These simple bradycardias are easily recognised by the fact that the rate is quickly increased by test exertion. Tachycardia is a far more difficult question, almost as difficult as the question of systolic murmurs. A patient has persistent simple tachycardia which increases on excitement, with exertion, and is reduced by rest though not completely. It lasts for months; digitalis fails to control it, as we have all found out; and we do not know how to stop it. But does it mean heart disease?—that is the question we have to answer. We will dismiss at once those cases in which it springs from pulmonary tuberculosis or hyperthyroidism, and not infrequently from chronic alcoholism. Setting these apart, we find it often associated with a neurosis, but not invariably. There are quite a number of cases of persistent tachycardia in otherwise healthy people without any trace of nervous instability. These are among the mysteries of ordinary clinical practice. Their tachycardia is the only positive sign. I am inclined to think they tend gradually to get better, but exact observation of them on any large scale seems to be wanting. A medical inquirer in general practice may one day give us this information. It is noteworthy that simple tachycardia, unless there is an underlying cause directly affecting the myocardium, does not seem to lead to heart enlargement or indeed failure. In pulmonary tuberculosis the heart is rapid, yet it does not enlarge despite the powerful toxins in circulation.

In modern practice we endeavour to distinguish a paroxysmal tachycardia from all other kinds. If it is an attack that starts abruptly, persists at a fixed high rate for a circumscribed period, and then ends abruptly, we are dealing with a case of paroxysmal tachycardia. If the patient is subject to such attacks, and continues perfectly well and free from abnormal signs in the intervals between them, it may almost be allowed that he has a healthy heart. If an electrocardiogram, taken during an attack, records ordinary paroxysmal tachycardia (and not auricular flutter or fibrillation), such a case is the best example we can quote of a functional heart disease, a term which has so often included little but functional nervous disease.

Then we have heard much in recent years of irregularities of the heart which do not imply heart disease. In children, and in adults too, there is often noticed a respiratory irregularity, sinus arrhythmia, the heart slowing during expiration and quickening during inspiration; and none of us now would take such a thing as a sign of disease. Similarly, if we found extrasystoles in a patient, disappearing on exertion as they do, or a patient complained of what were obvious extrasystoles, we should not take the same line as once was taken. These are not in themselves an index of heart disease, although they may occur along with it.

Before leaving the subject of signs, we have to note the absence of signs of cardiac failure. When we examine a patient with heart disease we are not surprised to find a slight enlargement of the liver, or a few crepitations at the bases of passively congested lungs, or some malleolar œdema. These are what we should look for as signs of failure, and we should not expect to find them in a patient without heart disease. When they are absent in a patient who maintains that he has had heart disease for 12, 15, or 20 years, we begin to ask ourselves whether this really is heart disease, and if it is, why this patient has been so favoured as never to get the signs of cardiac failure.

Therefore, if we get no history of an illness which can produce heart disease, no age changes, no symptoms, and none of the characteristic signs of the kind ordinarily found on examination, we get rather happy in approaching our diagnosis of a healthy heart.

SOURCES OF DIFFICULTY.

It would not be fitting that I should speak of the diagnosis of a healthy heart without referring to the greatest sources of difficulty in its diagnosis because of the mask of physical health which diseased hearts may wear. There are four or five conditions which display such a faint imprint of their cardiac origin that we may easily be misled into believing the heart is healthy when, in fact, it is stricken.

First of all we have *angina pectoris*. I cannot accept any definition of angina pectoris which does not connote danger to life. We all know how varied are the views as to its causation—let us meet on this common ground of understanding. The patient has something which demands diagnosis and treatment and a very careful and judicious prognosis. But the difficulty is that the patient may have angina pectoris and yet not have the signs of heart disease. The size of the heart may be normal, there may be no murmurs, the blood pressure may not be raised, yet the patient has angina pectoris and is confronted with death in each attack. To pursue the question of how we are to tell whether the patient has a healthy heart and has not angina pectoris would take us too far upon a side-line of argument; but in a word or two I would say that we can and must be prepared to diagnose angina pectoris from the patient's statements. Whatever the signs, whatever the history, if a patient complains of a severe pain—or merely an unpleasant pain—in the sternum or even in the breast or arm on exertion, and on exertion only, we dare not say that such a patient has a healthy heart. It is not healthy because it cannot do its work—at any rate, a sustained and reasonable amount of work. Whatever the signs and associations, we should view such cases with great seriousness, and insist on a complete examination to include the electrocardiogram and a Wassermann reaction. For angina pectoris in middle age is mainly due to syphilis and to nothing else. In older people the pathological basis is oftener non-syphilitic aortic and coronary disease. The importance of recognising syphilitic angina is that we have not merely a means of confirming its diagnosis, but a means of treatment which is going to relieve, if not actually cure, many a sufferer otherwise doomed to endure its torment. Mercury and iodide have not lost their power in syphilitic lesions because of the advent of a newer and stronger remedy which here may not always be applied with safety.

A second difficulty may be to decide whether *valvular disease* is present or absent. The absence of a presystolic murmur should not predicate the absence of mitral stenosis. It is most disturbing to find that a patient in whom we have heard this murmur one week has dropped it the next and seems to have a healthy heart. So a loud or sudden first sound, or a double first sound, especially with accentuation of the pulmonary second sound, though not diagnostic of mitral stenosis, may serve to check a too precipitate assertion of its absence. When such sounds are found we must pursue the diagnosis, searching for the murmur by listening at the apex with the patient standing, then immediately after exercise, lying on his left side. A definite presystolic murmur is the positive stamp of stenosis. The commonest effect of mitral rheumatism is the systolic murmur at the mitral area; but, so often does mitral stenosis accompany valvular incompetence, we might say with Graham Steell that a mitral systolic is the commonest murmur of mitral stenosis; stenosis which is necessarily of slower development, and may not produce until later its distinctive murmur. This deeper significance of a mitral systolic lends to it some importance, and justifies my emphasising among other values the history of rheumatism to prevent the fallacious diagnosis of a functional systolic murmur.

Aortic incompetence is the other valvular disease liable to be overlooked unless special care is taken, as it may begin with a quiet, low-pitched short murmur in a patient with few or no symptoms. The only safe plan of detection is to listen at the aortic area and to the left of the sternum in a quiet room, the ear being directly applied to the chest while the patient stops breathing for a moment, with the question in our mind to attune our ear: Is there an aortic diastolic murmur or not? The valvular lesion found among serving soldiers was less often mitral stenosis than aortic incompetence. A patient with mitral stenosis would be too breathless to keep on the march, but a patient with aortic incompetence might not only be able to march but to take part in vigorous sports such as boxing. The lesson for us is that with a definite aortic diastolic murmur, timed by the thumb on the carotid artery, it does not matter much about the history nor much about the symptoms, it is a case of aortic incompetence and not a case of healthy heart.

The third group of cases in which mistakes are apt to arise consists of those with hypertension or *high blood pressure*. We should be particularly alert when we encounter a class of symptom commonly considered peculiar to the menopause, to a neurosis, to obesity. High blood pressure is always a condition to bear in mind when the condition of the heart may be obscured by such concomitants. The woman suffering the manifold symptoms of the menopause may seem to be sufficiently free from indications of cardio-vascular disease until the day her blood pressure is taken. Similarly the sensations of the neurotic may be coloured by the circulatory embarrassment of high blood pressure. When people are very stout we naturally expect them to suffer from breathlessness on exertion, and we are not surprised to find them following the cardiac fashion of stopping at frequent intervals to admire the scenery! Because of this we need not assign to a fat patient the mischievous diagnosis of "fatty heart"; nor, on the other hand, assume that the circulation is healthy because obesity may seem to account for the symptoms. The point I wish to make is that hypertension may be present in obesity and explain symptoms which may wrongly be imputed to other causes. The sphygmomanometer is therefore one of the best instruments to prevent the mistaken diagnosis of a healthy heart, or rather of a healthy circulation; for it permits the proper recognition of cardiac symptoms amid the welter of misleading circumstance, and places us in touch with that very common disease hyperpiesis, or primary high blood pressure, which is responsible for so much suffering and mortality in late middle life and early old age.

In looking at the last of the common difficulties which compass the diagnosis of a healthy heart, allow me to explain why so often the *nervous system* must be taken into account to settle the question, Is our case one of a nervous or a true cardiac disease? There is some justification for patients ascribing their symptoms to the heart when they feel palpitation, especially when the conscious thumping is rapid or irregular. The thought of some heart trouble is naturally prompted when they feel pain below the left breast or feel very weak and tired. These are symptoms which suggest to the patient heart disease, and perhaps to the doctor the same preliminary belief which should as quickly as possible, if found untenable, be dismissed. Apparently functional nervous disease is something of which a patient is ashamed, and so there are substituted cardiac troubles or heart attacks, which are regarded as more honourable. But it has a bad moral effect upon us to allow the false diagnosis of cardiac disease to stand when really the patient is suffering from a neurosis, or from some condition which is the outcome of his neurotic temperament. The false diagnosis draws the attention away from the proper line of treatment, which is one not related to the heart at all, besides being unfair to the relatives, who may be imposed upon by the sufferer and led to imagine that a life is in jeopardy. When faced by the neurasthenic, though his case appears quite plausible as one of cardiac disease, we must not forget all we have learned and seen about such disease, and we must not allow him to retain improperly a diagnosis which, after all, is not even relatively one to be desired.

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Alkali Reserve of the Blood in Urinary Infections.

Experimental work on animals was first carried out to discover whether acidosis occurs in infections of the urinary tract with the colon bacillus. Rabbits of 1500 to 2000 g. weight were selected. Catheter specimens of the urine of these animals were cultured, and the urine also examined microscopically for pus and casts, to prove a normal condition of the urinary tract before experiments were begun. An initial estimation of the alkali reserve of the plasma was also made, 3 to 4 c.cm. of blood being collected under paraffin from an ear vein, and the plasma CO_2 estimated in a Van Slyke micro-pipette.

After these preliminary observations had been made, an emulsion of *B. coli* was injected intravenously. Thenceforth the urine, collected from metabolism cages, was examined daily for increase in albumin and for pus and casts; if these appeared, catheter specimens of urine were obtained and cultures made. Estimations of the alkali in the plasma were made within 24 hours of the injection of organisms, and repeated at intervals of a few days as long as the urine showed the presence of an infection.

Of 12 rabbits treated in this way, two died within 24 hours and three showed no infection. The remainder developed urinary infections in varying

since the urine was voided, the pH of a specimen which at first appeared to be 7·9 might prove to be 7·7 or 7·6 after this treatment. Even after saturation with alveolar air the pH of the urine as excreted would have been a little lower than that found, as the CO_2 tension in the kidney is higher than in alveolar air. The difference would only be significant in the case of very alkaline urines. Further, Davies, Haldane, and Kennaway have shown that the percentage of CO_2 in the alveolar air is raised during the administration of alkalis; the result obtained was, therefore, more alkaline than would have been the case had the specimen been brought into equilibrium with the patient's own alveolar air.

Results.

In all our cases the relief of symptoms, frequency and pain on micturition, backache and fall of temperature went hand in hand with the rise in pH of the urine. Table IV. shows the rapidity with which some of the cases responded to alkaline treatment: there was no delay such as was found by Palmer and Henderson in cases of chronic nephritis, in which 15 to 110 g. a day of alkali were required to bring the pH of the urine to 7·0. The pH of the most alkaline specimen of the series was 8·7. In no case was a pH obtained approaching 9·2, the point at which inhibition of growth of *B. coli* was found by Shohl and Janney to occur in alkaline media. Furthermore, in no case was there more than an insignificant diminution in the number of bacilli and the amount of pus present.

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				5 P.M.	7·4	
	8/10	,, t.d.s.	6	6 A.M.	6·1	Normal.
				7 P.M.	6·6	
Mrs. C.	24/7	Gr. 30 3-hrly.	16	7.45 P.M.	7·0	
	25/7	,, ,,	16	5.30 A.M.	6·7	
				6.30 P.M.	7·8	
Mrs. R.*	8/6	Gr. 30 t.d.s.	—	6.0 P.M.	5·6	103°
	9/6	,, ,,	—	6.30 A.M.	5·6	101·8°
				6.30 P.M.	5·6	
	10/6	,, 4-hrly.	—	6.30 A.M.	5·6	100·2°
				6.0 P.M.	5·8	
	11/6	,, ,,	—	6.0 A.M.	6·0	98·0°
				6.30 P.M.	7·4	98·6°

* For alkali reserve, see Table III.

Clinical Notes.

Mrs. G.: Oct. 6th, rigors, vomiting, abdominal pain, frequency. Oct. 8th, no pain or frequency.

Mrs. C.: July 22nd, pain and frequency subsiding immediately on treatment (first specimen obtained two days after admission).

Conclusions.

1. No evidence that a condition of acidosis occurs in acute coliform infections of the urinary tract has been found either experimentally or clinically.
2. The alteration in the amount of pus and bacilli in the urine following alkaline treatment is not sufficient to account for the improvement which takes place in the patient's symptoms.
3. This improvement appears to be definitely associated with a decrease in the hydrogen-ion concentration of the urine, and it is reasonable to suppose that a urine of high hydrogen-ion concentration irritates the inflamed mucous membrane of the urinary tract.

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ACCORDING to C. Worster-Drought and A. Mills Kennedy, "in man, for whom the meningococcus is definitely pathogenic, there is overwhelming evidence that the meninges are pre-eminently the site of election for this organism." The cocci, "on reaching the blood-stream from the naso-pharynx, are quickly carried to their destination," as if directed by some voluntary effort or by a mysterious power—their presumptive affinity for meningeal structures—"leave the blood-stream and localise in the subarachnoid space."

It would be easy to quote almost identical or similar opinions of the most competent authorities from the French (Dopter), German (Gruber and Kerschensteiner), or Polish (Droba and Kuczera) medical literature. Nevertheless, this "overwhelming evidence" is far from being as indisputable as it seems at first sight; and even in the monograph of the above-mentioned English authors we meet with details well adapted to disturb this rather excessive assurance. I mean particularly the cases intermediate in character between the pure septicæmic variety of the meningococcal infection and the ordinary fulminating type with meningitis. "In these cases, the course lasts only from 24 to 48 hours: blood cultures or cultivations from the heart blood taken post mortem yield meningococci. The brain and spinal cord may be practically normal in appearance or the ventricle may contain a small quantity of turbid fluid. The ventricular fluid, however, when planted out on to a suitable medium, gives growth of meningococci."

Route of Invasion of the Meningococcus.

According to these records, made by Herringham and Thornley and Symmers, to which we may add further analogous cases from Droba and Kuczera, Drigalski and Goeppert, it would appear quite evident that the meningococcus penetrates into the ventriculo-subarachnoid system, contrary to the hitherto expressed opinions, not through the meninges but through the choroid plexuses. This latter view is strongly corroborated by the histological investigations of Dopter who, in fulminating cases, found an acute inflammation of the plexuses, and in his monograph illustrates this change by very instructive figures. In cases having a longer course, this lesion seems to retrograde quickly in the subsequent stages of the disease.

The invasion of the meninges—i.e., of the primarily and chiefly affected arachnoid-mater, by the meningococcus directly from the circulation, appears quite incomprehensible, as this membrane is non-vascular. On the contrary, we can easily understand that during the bacteriæmic "pre-meningitic" stage a metastatic focus—analogous to the foci seen in the skin under the shape of various rashes—may develop in either of the choroid plexuses—richly vascular, secretory organs, to be regarded as a sort of cerebral kidney. Owing to the peculiar structure of the plexus-villi, the focus soon reaches and infects their epithelial lining. The infection, at first local, subsequently extends rapidly, finally constituting a general ventriculitis, encephalo-coilitis (ἐγκέφαλος, brain, and κοιλία, cavity), or choroido-ependymitis.

The meningococcus is in truth a very slightly pathogenic organism, but its feeble virulence is largely counterbalanced by its remarkable power of multiplying, which enables it to appear sometimes in the blood films, or at least to provoke extremely extensive maculo-papular, petechial, or purpuric rashes scarcely ever met with in other septicæmic infections. The degrees. Two became acutely ill; one of these died after five days, autopsy showing a slight bilateral pyelitis, marked inflammation of the vesiculæ seminales and also of the gall-bladder, the bacillus injected being recovered from the urine and bile; the other showed small cortical abscesses in both kidneys, and very marked inflammation of the left testis from which the bacillus was recovered. Two other rabbits developed chronic urinary infections, pus and bacilli persisting in the urine for five weeks, and three showed a transient infection of the urine lasting only a few days.

In none of these cases was there evidence of a permanent acidosis. In seven out of eight rabbits examined within 24 hours the plasma bicarbonate showed a diminution varying from 6 to 20 per cent. This is in accordance with the findings of Hirsch, who observed an immediate fall of the plasma alkali following the intravenous injection of various organisms. In every case, however, this initial drop was followed by a return to normal within 48 hours, which was maintained as long as the animal was under observation.

It was, however, recognised that the rabbit is not an ideal animal for this research. Chronic infections are difficult to produce, and acute infections are too rapidly fatal to be useful for experimental purposes. Observations on the blood cannot be made sufficiently often, owing to the severe degree of anæmia produced by repeated bleedings. Furthermore, the rabbit when ill will eat only the cabbage in its food, leaving the oats, and any slight degree of acidosis might thus be masked by the diet.

For these reasons, experiments on animals were abandoned, and a series of observations was undertaken on the alkali reserve of hospital cases of acute *B. coli* pyelitis. The cases were under the care of Mrs. E. E. Flemming, M.D., and Miss D. C. Hare, M.R.C.P., to whom our grateful thanks are due for the facilities given us. Only those cases who were sufficiently ill to require treatment as in-patients were examined. The estimation of the alkali reserve was made, whenever possible, before treatment was begun, as well as at intervals during subsequent treatment with alkaline or acid salts. The plasma bicarbonate was estimated in most cases in capillary blood taken from the ear, using Martin's method, which we find gives the same results as those obtained by using a Van Slyke pipette. The percentage of CO_2 corresponding to these titrations in the capillary blood of 11 presumably normal people averaged 57·5 per cent., the actual figures varying from 47·5 to 68·5 per cent.

The results of observations made on six patients suffering from *B. coli* pyelitis before treatment had been begun are shown in Table I.

TABLE I.

Name.	Plasma CO_2 in capillary blood.	Name.	Plasma CO_2 in capillary blood.
	Per cent.		Per cent.
Mrs. G. ..	61	Mrs. J. ..	62
,, F. ..	68·5	,, S. ..	62·5
,, T. ..	49	,, D. ..	51

It will be seen that in none of these cases was there any diminution of the alkali reserve of the plasma sufficient to be considered abnormal. Tables II. and III. show the very slight effects produced in the alkali reserve of the plasma of the same patient by treatment either with alkalis or acids. The improvement in symptoms in such cases cannot, therefore, be due to the neutralisation of an acidosis, for the condition did not exist.

TABLE II.—*Mrs. C.*

Treatment.	Drug.	Grams per diem.	Duration of treatment.	CO_2 of plasma from ear.
			Days.	Per cent.
Alkaline ..	Pot. cit.	16	2	50·5
	,,	16	7	50
—	Urotropine.	4	10	50
Acid ..	Urotropine with ac. sod. phosphate	6	11	50

TABLE III.—*Mrs. R.*

Treatment.	Drug.	Grams per diem.	Duration of treatment.	Date.	Per cent. CO_2 plasma.	
					Vein.	Ear.
			Days.			
Alkaline ..	Pot. cit.	4	—	9/6	59·7	—
	,,	12	4	12/6	—	64
	,,	18	2	15/6	—	67
—	Urotropine.	4	8	23/6	—	60·5
Acid ..	Ac. sod. phos. added.	5·2	2	1/7	—	58
		8	22	7/7	—	55
				14/7	—	59
				20/7	—	56
		16	7	24/7	—	56
				28/7	61	—

Influence of Treatment on Reaction of Urine.

Dismissing the question of an acidosis, we then considered the possibility that the acid urine, constantly found in these cases before treatment, irritated the inflamed mucous membrane of the urinary tract, and that the improvement on treatment with alkalis was due to the substitution of this irritating fluid by a neutral or alkaline urine. Preliminary observations were then made to study the effect of solutions of varying pH upon tissues denuded of their epithelium. Mixtures of acid and basic phosphates, isotonic with the blood, varying in pH from 4·0 to 9·0, were made up. Into these was dipped a finger with a newly inflicted cut or abrasion of the skin. It was found that a solution of pH 4 caused acute pain; between 5 and 6 a stinging sensation was produced, and between 6 and 7 a slight but definite discomfort and smarting. Solutions of pH higher than this had no effect till pH 9·0 was reached; this was found to be definitely soothing to an irritated surface. Comparable experiments were also made upon the mucous membrane at the urethral orifice in patients under treatment for urethritis. These, however, proved to be of little value; there was in every case complete insensitiveness to any of our solutions, probably accounted for by much previous treatment with strong disinfectants, some of which. such as 1 per cent. lactic acid, had a pH far lower than that of our phosphate mixtures.

We then made a series of observations on the urines of hospital patients undergoing medical treatment of pyelitis due to *B. coli*, to find out whether the improvement in the symptoms could be correlated with the alteration in the reaction of the urine. Specimens of urine were collected twice daily in wide-necked bottles containing toluene, which were filled to the brim with the freshly passed specimen and stopper replaced. Kept in this way there was only a slight loss of CO_2. The pH of the urine was estimated by the method described below; at the same time a note was made of the amount of pus and bacilli present.

Method of Estimating the pH of Urine.

A rough idea of the pH of the urine was obtained by noting the colour it produced with various indicators on a porcelain matching-plate. 5 c.cm. o the specimen were then measured into a standard test-tube. 0·5 c.cm. of the appropriate indicator added. and the colour matched with standard phosphate mixtures of known pH in a comparator. the colour of the urine being compensated in the usual way. If the pH were greater than 7·0. the urine was saturated with the alveolar air of the observer until no change of colour occurred. If CO_2 had escaped since the urine was voided, the pH of a specimen which at first appeared to be 7·9 might prove to be 7·7 or 7·6 after this treatment. Even after saturation with alveolar air the pH of the urine as excreted would have been a little lower than that found, as the CO_2 tension in the kidney is higher than in alveolar air. The difference would only be significant in the case of very alkaline urines. Further, Davies, Haldane, and Kennaway have shown that the percentage of CO_2 in the alveolar air is raised during the administration of alkalis; the result obtained was, therefore, more alkaline than would have been the case had the specimen been brought into equilibrium with the patient's own alveolar air.

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susceptibility, the lack of resistance of the organism, however—not its movement towards the meninges—constitutes the real reason why the general blood infection is, as a rule, of very short duration. In fact, as soon as the patient develops even the slightest degree of general immunity, the meningococci present in the circulation are impaired in vitality, lose their power to bring about metastatic lesions, and finally are completely destroyed. The former foci in the depth of the tissues disappear in a few days; and the rapid retrocession of the cutaneous changes offers us an excellent opportunity of following this process closely. Occasional metastatic lesions in the meninges, if they exist at all, must exhibit, no doubt, the same retrograde evolution, for the specific defence substances of the blood have as completely free access to these thecæ with their endothelial lining as to any other serous membrane or parenchymatous organ. Besides, whenever a certain part of the subarachnoid space—e.g., the spinal theca—is cut off from communication with the ventricles and thus ceases to be continually infected, the meningococci there disappear immediately, and the inflammation thereupon assumes a serous character. This must be regarded as the best proof that an autonomous meningitis independent of the ventricular process does not exist at all.

The conditions encountered by the infectious process in the cerebral ventricles are fundamentally different. The surface of these cavities is ontologically external, and possesses, in contrast with the meninges, not an endothelial but an epithelial lining. This layer constitutes normally for the proteins, and thus also for the antibodies of the blood, an almost impenetrable barrier; and even in the course of ventriculitis, when the inflammatory exudate carries some amount of plasma into the ventricular cavities, this obstacle is very serious. It is also of great import that this exudate is continually diluted by the cerebro-spinal fluid secreted in the ventricles. So we must conclude that the meningococci find in the cerebral ventricles extraordinarily favourable conditions for their existence, even more favourable than those upon the mucous membranes of the respiratory passages. Consequently, they can maintain themselves here for weeks, and even for months sometimes, while the continuance of any other deep infectious focus has long become quite impossible.

To emphasise that, in the above conception of meningococcal infection, we are not compelled to assume any mysterious faculty, for instance any special affinity of the meningococcus; it is sufficient to assume that it has certain properties which can be easily ascertained: (1) the ability to live in and upon the epithelial lining of the respiratory passages or of the cerebral ventricles; (2) surprising power of multiplying, but only (3) a slight power of resistance.

Course of the Disease.

In the course of the disease, three *étapes* may be distinguished: (1) meningococcal grippe, the only localisation apt to spread and to form epidemics, as pointed out by the author in 1905, and by Dopter in 1909; (2) septicæmia; and (3) choroido-ependymitis. The *étapes* do not constitute definite stages (periods), as only the second is transient, while the first and the third may last simultaneously for weeks and months. In the first, the process, affecting comparatively resistant structures, chiefly the naso-pharynx, is generally characterised by quite insignificant reactive symptoms.

When comparing systematically, during the course of cerebro-spinal fever, the fluid afforded by ventricular puncture and that obtained from the spinal theca, we soon find that the meningococci multiply principally, or rather exclusively, in the ventricles; and the spinal fluid contains only those cocci that it brought on passing from the ventricles into the subarachnoid space. In addition to this, both fluids generally differ greatly in their qualities, even in cases where there is no evidence of any serious obstacle to communication between them. Two cardinal types may be distinguished.

In the one, the reactive inflammation of the ventricles is quite insufficient; their fluid may appear quite clear to the naked eye; the white cells therein are very few, the mononuclears, lymphocytes, and epithelial cells are largely predominant or exclusively present; in short, suppuration is practically absent, and the reactive process has the character of serous inflammation or even simple irritation. Nevertheless, the ventricular fluid is sometimes directly crowded with extracellular diplococci, and the films may give the appearance of a pure culture. Now, fluid of such character is being continually evacuated into the subarachnoid space, and it is not till it gets there that definite reactive phenomena, suppuration, phagocytosis, and bacteriolysis take place to a greater or less extent. It is evident that the proper and real site of infection lies here in the ventricles, although the suppurative inflammation is completely confined to the meninges.

The other type arises in its purest form when an energetic suppuration, together with phagocytosis and bacteriolysis, has already developed in the ventricles. Films from the ventricular fluid may then exhibit almost the same picture as those from the spinal fluid. A leucocyte count, it is true, shows figures that are from several times to several scores of times as large for the spinal fluid as those for the ventricular fluid. The conclusion, however, that the leucocytes have originated from the particularly active subarachnoid suppuration, must appear erroneous, as the albumin content of both fluids is practically equal. We are compelled to admit that the white cells with their ingested meningococci have almost all come from the ventricles. Their increase in the subarachnoid space is brought about by the resorption of the fluid parts, while the cellular elements are retained by the thecal membrane acting as a filter. An identical opinion has been already expressed by Tinel as to the sheaths of spinal nerve roots, on account of the fact that, on histological examination, they exhibit no inflammatory vascular or perivascular reaction and no infectious nodules.

Explanation of the Anatomical Lesions.

All this brings us directly to the most interesting problem of the explanation of the anatomical lesions. Indeed, if cerebro-spinal fever has been hitherto regarded as a primary purulent meningitis with ventriculitis as a possible secondary, but not necessary lesion; this opinion is based upon the fact that in earlier stages of the disease the ventricular changes are often very slight and sometimes appear to be absent (to the naked eye), while thick and extensive layers of purulent exudate cover the meninges. So authors were induced to assume that this pus is formed in situ as a result of local purulent inflammation. In this supposition, however, they did not take into consideration that the ventriculo-subarachnoid system is filled with fluid which exhibits a certain current, slight, it is true, but nevertheless permanent, as it is secreted exclusively in the cerebral ventricles by the choroid plexuses, and absorbed exclusively throughout the extent of the subarachnoid space. On account of this current we are brought to consider the possibility that the pus cells found upon the meninges may sometimes, indeed, have been produced in situ, if the membrane received for absorption a fluid charged with free meningococci; but that, more frequently, they draw their origin from the ventricles or other parts of the meninges, and only settle down upon the thecal membrane as upon a filter. The largest accumulations of pus must thus arise in the areas where absorption of the fluid is most active. As of the two leptomeninges the arachnoid mater is the chief absorbent one, it will also be more affected. As regards distribution of the pus over the cerebral surface, it principally accumulates over the frontal and the anterior part of the parietal lobes, as we may suppose, because

that is the highest part of the cranial cavity in a reclining patient; and thus the venules of the subarachnoid space must here show the lowest, perhaps even a negative blood pressure, and can exercise, upon the fluid of the perivascular spaces which are continuous with the subarachnoid cavity, a definite sucking action. For accumulation of pus in the spinal theca, sedimentation may also be of some import.

As to the rest, a whole series of factors exist contributing to shape the anatomical picture and let it appear in very numerous modifications: varying intensity of the ventricular infection, different degrees of the reactive phenomena in the ventricles and subarachnoid space, varying level reached by the general immunisation, various impairment of the choroid plexuses in their secretory function; but, first of all, the varying degree of the inflammatory cerebral œdema, and the different modes of behaviour of the cerebral tissue in face of the condition of pressure resulting from œdematous swelling of the brain and the fact that this organ is shut up in a cavity having quite rigid walls.

Effects of Cerebral Œdema.

The highest degrees of cerebral œdema lead by means of circulatory disturbance to death in a fulminating manner; we may here speak of incarceration of the brain. In the acute fatal type, when puncturing the ventricles during life, we obtain an abundant flow of venous blood from different depths as a sign of passive congestion, and in autopsy the picture of cerebral purpura is sometimes well developed. The lumen of the ventricles is considerably narrowed.

If the consistence of the brain is uncommonly soft and flaccid, a condition frequently met with in infants, especially in those bottle-fed, the cerebral œdema and condition of pressure result soon in the narrowing, closing, and finally the obliterating of the sulci of the cerebral convexity. Now, in those parts of the subarachnoid space that have thus lost their connexion with the ventricles, both the infectious and the inflammatory processes disappear immediately. As larger masses of dense pus have not yet had an opportunity to develop, and as fluid containing only moderate amounts of pus cells vanishes readily by absorption, without leaving a trace, the leptomeninges of the convexity may afterwards appear quite unchanged, or, very rarely, some fragile adhesion with the dura mater remains as the only vestige of the completed process. In other cases, however, if larger purulent layers are already present in the sulci, the pus undergoes no absorption, but disintegrates, and is then penetrated by young connective tissue, finally forming in the meninges sclerotic and thickened plaques. After the sulci of the convexity and the anterior part of the base have been closed, the cisternæ of the base remain the only part of the subarachnoid space, within the cranial cavity, that communicates with the ventricles. Consequently, these alone will be filled up with pus. We thus get a full explanation of the pathogeny, hitherto obscure, of the posterior basic type as found in infants.

Swelling of the brain may further bring about a wedging of the oblong cord and the adjacent parts of the cerebellum into the foramen occipitale magnum. In autopsy, the wedged-in parts are separated from the rest by a marked furrow, being the impression of the edge of the foramen. The condition is associated with narrowing of the subarachnoid spaces within the wedged-in parts, and, in life, with signs of impairment of communication between the cerebral and spinal fluids. It may finally result in complete obliteration of the narrowed spaces, eventually fixed by adhesions.

According to my investigations, and contrary to the opinions expressed by many authors, the production of the fluid in the ventricles is never increased, but is lessened throughout the course of cerebro-spinal fever; the pressure of the fluid is therefore only moderately increased, normal, or even lowered. Nor have I ever found obstruction of the foramina Luschki or foramen Magendii. The above-mentioned changes, however, both constituting a consequence of cerebral œdema—i.e., obliteration of the sulci of the cerebral convexity and impairment of communication with the spinal canal, together with inflammatory changes of the membranes confining the basal cisternæ are quite sufficient to explain the pathogeny of hydrocephalus, as they all contribute greatly to impede the drainage of the ventricles.

With the progress of age, the consistence of the brain becomes more and more firm and resistant. Consequently, changes of configuration that would lead to obliteration of the cerebral sulci can develop only after a long duration. The subarachnoid spaces of the convexity thus remaining perfectly passable for a long time, are therefore the site of an active resorption of the fluid, and also of an abundant accumulation of its cellular elements. As the drainage of the ventricles is sufficient, at least in the earlier stages, hydrocephalus does not develop. On the other hand, the brain having but little possibility to change its configuration and to withdraw in that way from the pressure exercised on it by the osseous cranial walls—the pressure of the fluid is quite a different matter—suffers more through this condition, which in its turn manifests itself by violent cerebral symptoms.

In infants with their plastic brain, the cerebral manifestations are, on the contrary, quite colourless, and so the disease remains very often undiagnosed, not only by general practitioners, but sometimes even by most competent examiners. So, when J. Thomson, speaking about the posterior basic meningitis in infants, states that "in a considerable proportion of cases . . . there is a history of antecedent catarrh of the nose, bronchi, or intestines"; that "the three cardinal symptoms of the early stage are *head retraction*, *vomiting*, and *convulsions*," I must admit that I think there is some error in these statements, because I never saw a meningitis begin in that way, and had plenty of opportunities to meet with cases remaining undiagnosed until the third week. Thus, so far as my experience goes, the presumptive antecedent catarrh is to be regarded as the initial period of definite meningitis, and the symptoms of the supposed early stage as a condition of definitely constituted hydrocephalus. To become persuaded of the truth of this assertion, it is sufficient to determine the width of the ventricles: they are already, in the latter stage, considerably dilated, the lumen measuring about 30 mm.

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The notion that, in cerebro-spinal fever, the ventricles constitute the only really essential site of infection is, no doubt, of great import for serotherapy, for it points out the fact that this cardinal focus must be attacked first of all by serum, the presence of serum in the subarachnoid space being without significance. In fact, we may count upon a therapeutic effect only if the concentration of serum throughout the ventricular system is so high that it lets the fluid give, with the emulsion of the autogenous strain of meningococcus, the complement-fixation reaction. This concentration must be maintained during several days until the examination of the ventricular fluids—the state of the spinal fluid is unreliable—shows absence of meningococci.

In most cases this aim is easily attained even by epimedullar administration—i.e., by injecting the serum through the lumbar puncture. Indeed, when letting out, before injection, a sufficiently large amount of fluid, injecting adequately large doses of serum, and repeating the procedure every day, we can find—using for the determination a specific anti-horse precipitating serum—the concentration of serum in the ventricular fluid, shortly after epimedullar injection, as high as about 10 per cent., and after 24 hours, before the next injection, not lower than 3, or, at least, 1 per cent. If the standard of

susceptibility, the lack of resistance of the organism, however—not its movement towards the meninges—constitutes the real reason why the general blood infection is, as a rule, of very short duration. In fact, as soon as the patient develops even the slightest degree of general immunity, the meningococci present in the circulation are impaired in vitality, lose their power to bring about metastatic lesions, and finally are completely destroyed. The former foci in the depth of the tissues disappear in a few days; and the rapid retrocession of the cutaneous changes offers us an excellent opportunity of following this process closely. Occasional metastatic lesions in the meninges, if they exist at all, must exhibit, no doubt, the same retrograde evolution, for the specific defence substances of the blood have as completely free access to these thecæ with their endothelial lining as to any other serous membrane or parenchymatous organ. Besides, whenever a certain part of the subarachnoid space—e.g., the spinal theca—is cut off from communication with the ventricles and thus ceases to be continually infected, the meningococci there disappear immediately, and the inflammation thereupon assumes a serous character. This must be regarded as the best proof that an autonomous meningitis independent of the ventricular process does not exist at all.

The conditions encountered by the infectious process in the cerebral ventricles are fundamentally different. The surface of these cavities is ontologically external, and possesses, in contrast with the meninges, not an endothelial but an epithelial lining. This layer constitutes normally for the proteins, and thus also for the antibodies of the blood, an almost impenetrable barrier; and even in the course of ventriculitis, when the inflammatory exudate carries some amount of plasma into the ventricular cavities, this obstacle is very serious. It is also of great import that this exudate is continually diluted by the cerebro-spinal fluid secreted in the ventricles. So we must conclude that the meningococci find in the cerebral ventricles extraordinarily favourable conditions for their existence, even more favourable than those upon the mucous membranes of the respiratory passages. Consequently, they can maintain themselves here for weeks, and even for months sometimes, while the continuance of any other deep infectious focus has long become quite impossible.

To emphasise that, in the above conception of meningococcal infection, we are not compelled to assume any mysterious faculty, for instance any special affinity of the meningococcus; it is sufficient to assume that it has certain properties which can be easily ascertained: (1) the ability to live in and upon the epithelial lining of the respiratory passages or of the cerebral ventricles; (2) surprising power of multiplying, but only (3) a slight power of resistance.

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When comparing systematically, during the course of cerebro-spinal fever, the fluid afforded by ventricular puncture and that obtained from the spinal theca, we soon find that the meningococci multiply principally, or rather exclusively, in the ventricles; and the spinal fluid contains only those cocci that it brought on passing from the ventricles into the subarachnoid space. In addition to this, both fluids generally differ greatly in their qualities, even in cases where there is no evidence of any serious obstacle to communication between them. Two cardinal types may be distinguished.

In the one, the reactive inflammation of the ventricles is quite insufficient; their fluid may appear quite clear to the naked eye; the white cells therein are very few, the mononuclears, lymphocytes, and epithelial cells are largely predominant or exclusively present; in short, suppuration is practically absent, and the reactive process has the character of serous inflammation or even simple irritation. Nevertheless, the ventricular fluid is sometimes directly crowded with extracellular diplococci, and the films may give the appearance of a pure culture. Now, fluid of such character is being continually evacuated into the subarachnoid space, and it is not till it gets there that definite reactive phenomena, suppuration, phagocytosis, and bacteriolysis take place to a greater or less extent. It is evident that the proper and real site of infection lies here in the ventricles, although the suppurative inflammation is completely confined to the meninges.

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Explanation of the Anatomical Lesions.

All this brings us directly to the most interesting problem of the explanation of the anatomical lesions. Indeed, if cerebro-spinal fever has been hitherto regarded as a primary purulent meningitis with ventriculitis as a possible secondary, but not necessary lesion; this opinion is based upon the fact that in earlier stages of the disease the ventricular changes are often very slight and sometimes appear to be absent (to the naked eye), while thick and extensive layers of purulent exudate cover the meninges. So authors were induced to assume that this pus is formed in situ as a result of local purulent inflammation. In this supposition, however, they did not take into consideration that the ventriculo-subarachnoid system is filled with fluid which exhibits a certain current, slight, it is true, but nevertheless permanent, as it is secreted exclusively in the cerebral ventricles by the choroid plexuses, and absorbed exclusively throughout the extent of the subarachnoid space. On account of this current we are brought to consider the possibility that the pus cells found upon the meninges may sometimes, indeed, have been produced in situ, if the membrane received for absorption a fluid charged with free meningococci; but that, more frequently, they draw their origin from the ventricles or other parts of the meninges, and only settle down upon the thecal membrane as upon a filter. The largest accumulations of pus must thus arise in the areas where absorption of the fluid is most active. As of the two leptomeninges the arachnoid mater is the chief absorbent one, it will also be more affected. As regards distribution of the pus over the cerebral surface, it principally accumulates over the frontal and the anterior part of the parietal lobes, as we may suppose, because

that is the highest part of the cranial cavity in a reclining patient; and thus the venules of the subarachnoid space must here show the lowest, perhaps even a negative blood pressure, and can exercise, upon the fluid of the perivascular spaces which are continuous with the subarachnoid cavity, a definite sucking action. For accumulation of pus in the spinal theca, sedimentation may also be of some import.

As to the rest, a whole series of factors exist contributing to shape the anatomical picture and let it appear in very numerous modifications: varying intensity of the ventricular infection, different degrees of the reactive phenomena in the ventricles and subarachnoid space, varying level reached by the general immunisation, various impairment of the choroid plexuses in their secretory function; but, first of all, the varying degree of the inflammatory cerebral œdema, and the different modes of behaviour of the cerebral tissue in face of the condition of pressure resulting from œdematous swelling of the brain and the fact that this organ is shut up in a cavity having quite rigid walls.

Effects of Cerebral Œdema.

The highest degrees of cerebral œdema lead by means of circulatory disturbance to death in a fulminating manner; we may here speak of incarceration of the brain. In the acute fatal type, when puncturing the ventricles during life, we obtain an abundant flow of venous blood from different depths as a sign of passive congestion, and in autopsy the picture of cerebral purpura is sometimes well developed. The lumen of the ventricles is considerably narrowed.

If the consistence of the brain is uncommonly soft and flaccid, a condition frequently met with in infants, especially in those bottle-fed, the cerebral œdema and condition of pressure result soon in the narrowing, closing, and finally the obliterating of the sulci of the cerebral convexity. Now, in those parts of the subarachnoid space that have thus lost their connexion with the ventricles, both the infectious and the inflammatory processes disappear immediately. As larger masses of dense pus have not yet had an opportunity to develop, and as fluid containing only moderate amounts of pus cells vanishes readily by absorption, without leaving a trace, the leptomeninges of the convexity may afterwards appear quite unchanged, or, very rarely, some fragile adhesion with the dura mater remains as the only vestige of the completed process. In other cases, however, if larger purulent layers are already present in the sulci, the pus undergoes no absorption, but disintegrates, and is then penetrated by young connective tissue, finally forming in the meninges sclerotic and thickened plaques. After the sulci of the convexity and the anterior part of the base have been closed, the cisternæ of the base remain the only part of the subarachnoid space, within the cranial cavity, that communicates with the ventricles. Consequently, these alone will be filled up with pus. We thus get a full explanation of the pathogeny, hitherto obscure, of the posterior basic type as found in infants.

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om the fluid and from the centrifugalised deposit. he fluid often yields a more copious growth, specially when containing extracellular cocci. he puncture of the lateral ventricles may be erformed on the vertex either about 1 cm. from the nedian line, the needle being directed downwards and little outwards (vertical internal puncture), or about –6 cm. from the median line, the needle pointing lownwards and somewhat inwards (vertical external puncture). We may also puncture the inferior horn in the midst of the temporal lobe, situated behind the orbit. We then puncture, in the line drawn vertically through the external auditory meatus, or somewhat behind, and several millimetres above the upper edge of the pinna; we direct the needle so that looked at from the front it appears to point towards the palpebral cleft (temporal puncture). The depth of the puncture measures in the vertical procedure somewhat more, in temporal puncture somewhat fewer, millimetres than the centimetres which go to the circumference of the head. The needle—charged with its brass wire, in order not to be obstructed by brain substance—should be thrust in very slowly, millimetre by millimetre, and the wire withdrawn after each advance. The depth at which the fluid begins to flow is noted; then, on continuing to thrust in the needle, the second depth at which the flow ceases. The difference of the two figures corresponds to the lumen of the ventricle along the puncture line. Normally, this lumen measures several millimetres; a lumen narrowed (possibly to complete closure) is a sign of cerebral œdema; on the other hand, enlargement can be thus followed by us closely from the beginning in the cases developing hydrocephalus. The secretion of cerebro-spinal fluid may be determined directly when, after the pressure has been brought down to the zero point, the fluid is tapped out of the ventricles for an hour or two, the amount withdrawn being noted after each interval of five minutes.

Albumin Content of Ventricular and Spinal Fluids.

The albumin is estimated by means of Mestrezat's diaphanoscopic method. The albumin content of the spinal fluid is almost always higher than that of the fluid tapped from the ventricles. The ratio of these two values has been termed by me the "albumin index." If it is higher than 5 (5 : 1), we can assume a stasis of the fluid within the spinal space as the result of impaired communication with the ventricles. If it is lower than 2, the closing of the cerebral sulci would be the cause, the current of the fluid then trending almost exclusively towards the spinal space, and the fluid being there absorbed quickly and thus having no opportunity to charge itself with greater amounts of albuminous exudate. Middle values, 2–5, are found when no such disturbances are present or when their effects counterbalance one another. Low albumin content of the ventricular fluid—e.g., 0·01 per cent.—may be further regarded as a sign that the current within the ventricles is very active. This occurs when the lumen is narrowed and the secretory function of the choroid plexuses but moderately affected. In such cases we also find that after intraventricular serum injection the albumin standard of the ventricular fluid diminishes very rapidly. The concentration of the injected serum in the fluid may be determined with approximate exactitude by using a specific rabbit serum precipitating the horse serum. In addition to this the complement-fixation reaction is performed in a series of dilutions by using as antigen the strain cultivated from the patient. To carry out all these investigations at least 6 c.cm. of each fluid are required.

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THE TREATMENT OF INEBRIETY AND DRUG HABITS.

By STANFORD PARK, M.B., Ch.B. Edin.,

RESIDENT MEDICAL SUPERINTENDENT, BAY MOUNT SANATORIUM, PAIGNTON.

About two years ago I published[1] a few comments on the treatment of inebriety and drug habits, and some later notes may now be of interest. The subject of temperance has attracted a great deal of attention from our legislators and a section of the public for many years, but, from the medical side, as far as treatment and cure of inebriety are concerned, very little has been done. A step forward was taken when it was realised that inebriety can be a disease as well as the result of weak will and wickedness.

Up to the present no specific for the disease has been found. The only definite line of treatment which has met with any degree of success has been the McBride method, employing atropine and strychnine. The chief alternative to this method has been the confinement of the patient for a considerable period in the hope that the drink craving would die down. The hope has proved futile. Patients under restraint without treatment almost invariably relapse as soon as they regain their freedom. The atropine treatment has given moderate results in a certain type of case and is still used in many homes, mainly, one fancies, for want of a better. Personally, I found, after fair trial, that this treatment and its various modifications was not a cure, and only a help in certain cases.

After trying many drugs, and with the assistance and advice of Dr. Harrison Martindale, I came to the conclusion that three substances were certainly of value used hypodermically. These were strychnine, 1/60 gr., twice daily; colloidal gold (sterules), 1 c.cm., three times daily, and calc. glycerophos., 2 gr., in 3 c.cm., 1·5 c.cm. once daily. Given by the mouth, in frequent small doses, I found the following all extremely useful: nux vomica, cinchona, kola, damiana, and gentian. Nux vomica by the mouth often gives better results than strychnine hypodermically. The following doses are best: Tr. nux vomica, 1 to 3 ♏; tr. kola, 10 ♏; tr. cinch. co., 10 ♏; ext. damian. liq., 10 ♏; inf. gent. co. conc., 12 ♏. These are best given, with ext. glycyrrh. liq., 5 to 10 ♏, in a teaspoonful of water, every two hours from 8 A.M. to 8 P.M. The nux vomica can be increased or reduced according to indications, and the same applies to the damiana, which is most useful in certain cases. Ammon. brom., 4 gr., and pot. brom., 1 to 2 gr., may be added at first, if indicated. I also found that Catha (5 gr. tablets Martindale's ext.) removes the craving for alcohol and morphine and the depression attending their use in a remarkable way in many patients. Its action is somewhat similar to that of caffeine. Other drugs proved of this serum is 1000—i.e., if the serum gives with the patient's meningococcus strain the complement-fixation reaction still in a dilution of 1 : 1000—the curative power of the ventricular fluid shortly after injection may be designated by the figure 100, and 24 hours later by 30 or 10. The sufficient intensity and continuousness of serum action is thus fully realised.

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[1] The Lancet, 1922, i., 691.

In other cases this realisation may be difficult to obtain when the serum is of low standard, or there are obstacles on its way from the spinal space to the ventricles. The greatest difficulties arise, however, in case of narrowing of the lumen of the ventricles in consequence of cerebral œdema. If so, the serum injected epimedullarly does not penetrate into the cranial cavity, or at least, not into the ventricles immediately after injection. The up and down motion of the fluid which—apart from the abovementioned current going from the ventricles to the subarachnoid space—exists between the cranial cavity, including the ventricles and the spinal space, and might be able to bring by degrees the serum, present in the latter space, into the ventricles is very active only in normal or slightly changed conditions. Here, as the range of the modifications of volume of the brain dependent on the incessantly varying quantity of blood in the vessels is considerably diminished, owing to the state of œdema and compression, this up and down motion of the fluid must be very slight too. Moreover, the current of the fluid, though secreted in lessened quantity by the affected plexuses, must, in the narrowed ventricles, be much more rapid than usual, and oppose the penetration of the serum. The great importance of the latter factor appears quite clearly when the serum is injected, in such cases, into the ventricles themselves, bilaterally, by means of temporal puncture, and the ventricles thus filled up with almost undiluted serum. In an hour and a half the concentration of the serum in the ventricles may fall as low as 3 per cent., and in eight hours or perhaps sooner reach the level at which its therapeutic action ceases completely. We should then be obliged, if these procedures are at all practicable, to repeat the intraventricular, bilateral injections, at equal intervals, several times daily; or else to wait until, with the impairment of drainage, the ventricles become markedly wider, and thus the conditions for epimedullar or, at least, intraventricular serum administration, more favourable.

Immunisation.

Similarly to the passive immunisation brought about by injected serum, the active immunity developing spontaneously or under the influence of vaccine treatment can only then react on the infectious process if the antibodies appear in sufficient quantity in the ventricular fluid. The albumin standard of the ventricular fluid is generally very low—e.g., 0·02 per cent. This would correspond to a plasma content of 0·22–0·24 per cent., or to a dilution of plasma, when passing with the inflammatory exudate into the ventricular cavity, of about 1 : 400. In such a case the therapeutic power of the patient's serum should be as high as 400 in order to reach the limit of activity within the ventricular cavities. The ability to acquire sufficient general immunity varies largely in different individuals. Some react very promptly and efficiently under the sole influence of the morbid process, while the others do not exhibit any immunisation which could be revealed by the complement-fixation or other serum tests, even after long treatment by autogenous vaccine.

In one of my cases, that of a boy aged 5, who had been insufficiently treated with intraventricular serum injections, a relatively high general immunisation was obtained by the vaccine injected at about weekly intervals rising from the initial dose of 200 millions to the dose of 30,000 millions of cocci, every dose being divided into from 10–40 smaller ones, injected separately under the skin. The value of the patient's serum, determined by complement-fixation reaction, finally oscillated between 100 and 300. The infectious process showed a marked improvement, but exhibited no tendency to definite cessation, and fluids, especially the ventricular fluids, continued to yield an abundant culture. There was an irregularly remittent pyrexia with elevations up to 40° C.; 16 c.cm of the patient's serum, freshly prepared, consequently working also as complement, were then, on the ninety-second day of the illness, injected into the right lateral ventricle. Immediate and complete recovery followed.

Apart from general immunisation, perhaps also some local processes—suppuration or local neutrophilic leucocytosis, local basophilia and eosinophilia, and possibly local production of antibodies—coöperate in combating the infection.

On the other hand, it is a well-recognised fact that suppuration becoming excessive and leading to accumulation of thick pus in the ventricles and the subarachnoid space is one of the causes of fatal issue. It is noticeable that, in these progressively purulent cases, the fluids, both ventricular and spinal, give with the autogenous meningococcus culture a marked complement-fixation reaction, sometimes in high dilutions. Specific serum is generally of no effect in this condition.

Technique of Ventricular Puncture.

To conclude, some words about the technique adopted for the investigations and procedures. As the ventricles form the cardinal site of the infectious process, the examination of the spinal fluid alone is evidently quite insufficient and apt to give a distorted idea of the true bearing of the case. Coincident examination of the ventricular fluid is most desirable if only for practical purposes, and thoroughly indispensable when scientific aims are at stake. So it has gradually become my habit to perform always, on principle, one after another both the lumbar and ventricular punctures; sometimes the puncture of the subarachnoid space of the brain was also performed, and yielded a third fluid for examination. The ventricular puncture is a slight operation easy to perform, not only on infants when we can enter the cranial cavity through the anterior fontanelle, but also on patients of any age when using the channel-borer devised by Goetze for piercing the cranium. This borer is only 1½ mm. thick. Its channel serves to introduce into the bore-hole, before the borer is drawn out of it, the glazed brass wire stretching out of the puncturing needle, and well adapted to conduct the needle afterwards into the bore-hole. The needle is 1 mm. thick, and ought not to be too sharp. No anæsthesia, either general or local, is necessary. The patients usually state that the operation gives them much less pain than the lumbar puncture. Every time a new bore-hole must be made. The procedure is quite safe; I have performed it over a thousand times since the year 1914. The pressure is always determined, as well for ventricular as for lumbar punctures, in a strictly horizontal position of the patient in order to obtain some inkling as to the possible impairment of communication between the cranial and spinal spaces. The number of white cells per c.mm. is estimated by means of the Fuchs-Rosenthal chamber, and the differential leucocyte count, executed in centrifugalised deposit films, dyed with phenol toluidine and Jenner's stain. The basophiles and eosinophiles are thus also kept under observation. They are generally quite absent in fatal cases; in moderately severe ones, rare at the onset, they become more numerous with the progress of improvement, but are most numerous in cases of spontaneous recovery, particularly at the moment of recovery, and may be met with for months afterwards, sometimes in considerable quantities. The number of meningococci per 100 white cells is estimated in toluidine-stained films and calculated per c.mm. The percentage of (1) intracellular, (2) extracellular cocci, and (3) organisms contained in epithelial cells is determined, and, on the other hand, the proportion of (1) well-preserved, and (2) altered cocci. Cultures are made escaped altogether, seems to emphasise the infectious or contagious character of the outbreak.

There has been little to aid us in fixing the incubation period. One boy was isolated on July 9th with fever and a sore-throat, and when Koplik spots appeared on the 11th he was moved into a sick room which had been vacated some hours previously by two boys who had recovered from epidemic pleurisy. He went through a mild attack of measles, and on July 17th, after several days of normal temperature, became feverish again with left pleurodynia. Next day a well-marked rub was heard. If the disease in this case was caused by direct contact with other boys the incubation period cannot have been less than eight days, but, of course, it is possible that the room or its contents conveyed the infection.

Unlike the Paddington Green cases, the illness often began or was accompanied by a sore-throat, sometimes simply a red granular pharyngitis, sometimes a definite follicular tonsillitis. In 27 of these 48 boys a well-marked throat lesion was noted. Swabs were taken of some of them, and there was reported a free growth of streptococci, with fewer colonies of *Staphylococcus aureus* and no diphtheria bacilli.

Another difference from the Paddington Green patients is that they never, with one possible exception, really suggested a pneumonia. Some were worse than others, but in no instance was the boy very seriously or acutely ill. In fact, it was remarkable how little constitutional disturbance there was in most of them. Even with a temperature of 103° or 104° F., and a loud rub, there was generally comparatively little distress. Cough was conspicuous by its absence, and there was never any sign of involvement of actual lung tissue.

In all cases there was more or less severe pleurodynia, but in only 17 out of the 48 did we satisfy ourselves that we heard a pleural rub. When a rub did appear it was often very loud indeed, and some patients could themselves feel or hear the creak at the end of inspiration, often long after it had ceased to be acutely painful. A marked feature was the liability to relapse, each rise of temperature being accompanied by the appearance of a fresh patch of pleurisy, three or even four relapses having occurred in some cases. No case had any signs of an effusion. Joint pains and albuminuria were absent. Apart altogether from relapses, many of these boys took a long time to get well, and some became anæmic and debilitated and had to be sent away on sick leave.

It is noteworthy that we have seen during the last few months several cases of a similar nature in patients in the immediate neighbourhood, apart from the epidemic in the school.

A governess and three children, aged 3 to 7 years, had simultaneously attacks of pyrexia. The governess had severe pleurodynia and the children complained of abdominal pain. In none of them could we detect a pleural rub, but they all relapsed, and clinically appeared to be identical with the cases we were seeing at the same time in the school a mile away.

A hospital nurse was admitted to the ward with pyrexia and abdominal pain, which at first suggested the diagnosis of acute appendicitis. Within a few hours, however, the temperature fell and the pain became confined to the chest and was only felt on deep inspiration.

A motor driver complained of pain in his side; temperature 100° F. There was a definite pleural rub. On the eighth day the physical signs had disappeared and he was apparently quite well again.

In conclusion, the facts suggest that we have been dealing with an infectious disease, showing a predilection for children and young adults, and manifesting itself clinically by producing a primary inflammation of the pleura. The frequency with which inflammation and infection of the tonsils and pharynx were associated with the onset of the illness suggests that the throat was the site of entrance of the causative organism. Whether the streptococcus which was isolated from the fauces in a few cases was in any way responsible for the epidemic it is impossible to say without further investigation. If we consider rheumatic fever as an acute inflammation of serous membranes usually preceded by a tonsillar or pharyngeal affection, with a tendency to occasional epidemic prevalence, a possible relationship between the two diseases suggests itself.

A CASE OF

HORIZONTAL DILATATION OF THE LEFT AURICLE.

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THE following case is similar to that first described in 1901 by Sir Isambard Owen and Dr. W. J. Fenton.[1]

Miss X., aged 26, was first seen in consultation with Dr. C. H. A. Alderton on June 12th, 1921. The matter in debate was whether she was fit to marry, seeing that she had a cough and was very short of breath and had so much pain in the region of the heart. She was known to have had pneumonia and pleurisy at the age of 12, and rheumatism of the heart at the same time. On examination she was found to have the maximum impulse of the heart in the fifth left interspace, well outside the mid-clavicular line, and murmurs were heard at this spot, indicating double mitral disease; the heart was not enlarged to the right. There were signs of consolidation at the left base behind, which explained the cough and yellow expectoration. As the heart-rate was rapid and irregular, she was diagnosed as a case of double mitral disease, auricular fibrillation, and pneumonia. There were no tubercle bacilli in the sputum.

She was not seen again until March 23rd, 1923, when again shortness of breath had become very severe, and she had expectorated about 4 oz. of blood about one week previously. She was also troubled with palpitation. On examination the impulse of the heart was found to be displaced to the left as before, but the mitral murmurs were not so audible. In addition, a large area of dullness had developed to the right of the middle line, which was continuous with the cardiac dullness, reaching up to the third right intercostal space, and well outside the right mid-clavicular line. In the third space the dull area revealed a well-marked systolic murmur and there was distinct pulsation in the same space outside the mid-clavicular line. The spleen was enlarged and readily palpable, and there was increase of the liver dullness two-fingers' breadth below the right costal margin. The diagnosis made was horizontal dilatation of the left auricle to the right, following Sir Isambard Owen and Dr. W. J. Fenton's description in 1901 of the first case.

She was admitted to University College Hospital on March 28th, 1923. To her former symptoms there was added a new one—namely, that after swallowing food pain developed in the right chest, lasting for about a minute. Her nutrition was defective; although her height was 4 ft. 9½ in., she only weighed 5 st. 9 lb. The dullness to the right of the heart was as extensive as before, and pulsation was now felt in the fourth and fifth right spaces as well as in the third and outside the mid-clavicular line. A systolic murmur could be heard at the apex, which was quite distinct from the systolic murmur heard over the area of dullness and pulsation of the right chest. The patient was a little cyanosed and became easily breathless on exertion; there was no ascites or dropsy; the urine was free from albumin; the temperature was normal; the pulse on admission was 100, and on discharge—after 12 days—had reached about 80: the blood pressure was 124 mm. Hg: there was no clubbing of the fingers.

X Ray Report by Dr. R. W. A. Salmond.

This was carried out on March 30th, 1923, and is as follows:—"On the right side of the chest there is a large rounded shadow which shows a pulsating upper margin but no pulsation on its lower margin. This shadow shows more density than the enlarged left side of the heart. In the lateral view the shadow on the right side extends backwards nearly to the spinal column, and is pressing on the œsophagus, so that when a barium feed is given it is definitely held up at the upper margin of the shadow. In addition to the compression of the œsophagus, the trachea and bronchi are displayed to the right. The amount of pulsation seen on the upper margin of the shadows of the right and left sides of the chest is against the shadow being that of a pericardial effusion. There are no obvious signs of disease in the lungs, and no signs of pleural effusion."

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[1] Clinical Society's Transactions, 1901, xxxiv., p. 183.

use in some cases. Various hypnotics must be used, and the most useful are chloralamide, methylsulphonal, and luminal. In drug cases sulphonal is often best. One can give up to 75 gr. of chloralamide and 60 gr. of methylsulphonal. When one drug alone fails, an excellent night's sleep is often obtained by giving a dose of the second three hours after the dose of the first drug. Chloralamide is safe, and can be given to patients in very poor health.

With regard to general treatment, ambulatory treatment nearly always fails and institutional treatment is essential. It is found also that patients do better in a small than in a large institution. In a large one they are apt to split up into cliques, and a drinking clique is formed whose members only wish to be patched up preparatory to starting another drinking bout. They have no intention of remaining cured, and are apt to lead other patients astray and introduce secret drinking into the establishment. In a small home patients are more under the direct observation of the doctor, and the moral influence is greater. It is advisable to place patients on parole after the first week or so. When they know they are trusted they seldom break their word, and if they do it is easily noticed in a small home that they have taken alcohol, and parole can be withdrawn.

In treating this class of case it is not only a question of what drugs to use, but also how to use them, and there is no doubt that the successful treatment of inebriety depends a good deal on the experience of the physician and the technique employed. Undoubtedly the manner of withdrawal of the stimulant is a very important point. As Dr. F. Hare has shown, nothing is to be gained, and frequently a great deal is lost, by a sudden withdrawal. From the third to the sixth day onward direct suggestion, applied in the hypnoidal state, is useful in many cases. At times sleep can be produced by it without the use of hypnotic drugs at all.

Results.

That treatment on the above lines is effective has been proved by the past few years' results at Bay Mount. Out of all cases treated between September, 1922, and September, 1923, in which a favourable prognosis was given before treatment was commenced, 92–3 per cent. have remained teetotal for from five to 17 months, and are still abstainers. In case it is suggested that this high percentage of successes is due to the exclusion of all except the mildest cases, I indicate the points which decided classification.

1. *Heredity.*—Patients with a history of insanity in the family were excluded, but an alcoholic ancestry of itself did *not* lead to exclusion.
2. *Health.*—Patients were excluded who were suffering from any disease which might drive them to drink.
3. *Age.*—Patients over 55 years were excluded, if the habit was of long standing.
4. *Unwilling Patients.*—A patient who came against his will, or to please his relations only, was excluded.

Apart from patients excluded for the above reasons, severe and chronic cases were included. If we take cases in which a good prognosis was not given, we find that over 50 per cent. of these have remained teetotal to date. When it is explained that several cases are included in this class who, for business or other reasons, did not complete the treatment, the results are even better than the figures indicate. I append three examples of cases in which a good prognosis was given, and three in which it was withheld.

1. Male, aged 52, had been drinking over a bottle of whisky daily for several years. Father a moderate drinker, grandfather a heavy drinker. Patient depressed, tremulous, sleeping badly, and appetite moderate. Blood pressure 160. Urine, trace of albumin. This patient did well, and left in better health than he had enjoyed for over five years, and has remained teetotal over 15 months.

2. Male, aged 48, had been drinking to excess since 1914; a few days' moderate drinking, then 48 hours' heavy drinking, then an abstainer for about three weeks. Father drank heavily for years. Several brothers also drank to excess. Patient very nervous, sleeping badly, and appetite poor. Blood pressure 132. Urine normal. After treatment patient had no desire at all for alcohol at his usual time for craving, and left in excellent health. He has remained teetotal for 12 months.

3. Female, aged 35, married. She had taken alcohol in moderation for some years, but after marriage some five years ago she began to drink to excess when alone, and gradually got to over a bottle of whisky a day. Had atropine treatment a year ago without benefit. Father and mother took a good deal of alcohol. Patient in fairly good condition, but not sleeping well. Blood pressure 125. Urine normal. Patient did well, and left in excellent health without any craving, and has remained teetotal to date, 11 months.

Bad prognosis cases:—

1. Female, aged 55, married, had been drinking steadily for over 15 years, taking one and a half bottles of whisky a day. Father and brother both drank to excess. Patient very thin, tremulous, and sick in the morning. Appetite small. Patient spent much time in bed and had no interest in life. Blood pressure 156. Urine normal. She did well under treatment, gaining 12 lb. in weight, and lost all craving, and took an interest in life again, getting up for breakfast and staying up all day. Husband reported 12 months after that she was teetotal and taking great interest in her home.

2. Male, aged 57, single, had taken alcohol all his life, but was teetotal from 1899 to 1905. Since then had been drinking steadily to excess. Mother mentally weak, and one brother died from drink. Patient very energetic, playing games all day long. He sleeps well, eats moderately well. Very tremulous and obviously eccentric and excitable. Under treatment he lost all desire for alcohol and left in good health, having lost his tremor, and has remained teetotal to date, 12 months.

3. Female, aged 56, widow, a notorious drunkard, who had had treatment many times in various establishments. She had been drinking heavily for years, breaking out every two or three weeks. Family history nothing to note. Patient had chronic bronchitis and was sleeping very badly. Appetite was small and capricious. Blood pressure 182. Traces of albumin in urine. Patient left after six weeks' treatment, having lost all desire for alcohol, and sleeping pretty well and eating well, and able to walk two miles. Has remained well and teetotal ten months to date.

Under this method of treatment, apart from a cure, patients get over the acute symptoms of alcoholism in a remarkable way. Usually within seven days they sleep six or seven hours at night, eat very well, and have lost all tremor, and, in fact, show very few outward symptoms of their drinking bout.

Clinical and Laboratory Notes.

EPIDEMIC PLEURISY.

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AND
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AN outbreak of this affection occurred in Eton College in May, June, and July of this year. In many respects it was very similar to that described in THE LANCET of July 12th, 1924, as having occurred in the country branch of the Paddington Green Children's Hospital last May. Curiously enough, these two institutions are not more than a mile apart, but, so far as we are aware, there is no intercommunication or connexion between them.

In all, 48 cases came directly under the care of one or other of us, but other cases, in addition to these, occurred in the school. The first began on May 11th and the last on July 15th. All the patients were boys of 14 to 18 years of age. They were scattered irregularly throughout the school, but the fact that some houses had as many as six cases, while others uterus. Behind its entry into the uterus the latter presents a bulging swelling which has ruptured and from which projects chorionic tissue. Attached to this and overlying it was a mass of chorionic tissue, forming the wall, a third of an inch thick, of a cavity about one inch in diameter. This cavity is lined by a smooth membrane and from its interior projects a thin filament, probably the umbilical cord. The uterus measures four inches by four. On section there is found to be an intra-uterine pregnancy containing an embryo about half an inch in length. The left Fallopian tube and ovary, which appeared healthy, were not removed.

Remarks.

This specimen is of interest because it exemplifies a comparatively rare condition known as tubo-uterine or interstitial gestation, and also a much rarer condition—viz., a concurrent intra-uterine pregnancy. The uterine fœtus appears to be about six weeks old, and one is led to speculate whether the two pregnancies took place at the same date. The specimen was sent to the Royal College of Surgeons Museum, and the illustrations are by Mr. S. A. Sewell.

AN UNUSUAL REFERRED PAIN IN A CASE OF CHRONIC APPENDICITIS.

BY SIR BRUCE BRUCE-PORTER, K.B.E., C.M.G.,
M.D. BRUX., M.R.C.S. ENG.

THE following case is published in view of the unusual situation of the referred pain.

L. S., aged 51, consulted me for pain in the right chest over the nipple area. The pain came on originally in 1919, and was very severe. He consulted a physician in Manchester, who suggested angina as a cause. He was next seen by a heart specialist in London, who also suggested angina and advised rest. He was given eight weeks' rest in bed, and, being no better at the end of this time, consulted an osteopath. After some treatment from him he felt better and remained so for a year. A return of the pain again sent him to a heart specialist, who advised Nauheim treatment for it, and he had 12 weeks at Spa with no improvement. He then consulted another physician in London, who suggested duodenal ulcer, and put him on strict diet for many weeks. There was no improvement, so he returned to the osteopath. Being no better, he next sought the advice of a surgeon, who took the view that he suffered from duodenal trouble or gall-stones and advised a period of diet, to be followed by operation if no improvement took place.

On July 4th of this year he consulted me. The heart sounds were normal and the blood pressure 120 maximum and 70 minimum. In pinching up the skin of the abdomen there was definite resistance over the appendix area, but nowhere else. Pressure over the appendix at once caused the patient to cry out, and place his hand over the right nipple area. He said, "Why, that is my pain," and each repetition of the pressure produced an exacerbation of the pain. There was a history of digestive troubles in childhood and during early manhood. I advised early exploration and removal of the appendix, after a very septic condition of the teeth and gums had been cleared up.

Operation.—Sir Alfred Fripp opened in the middle line, and, before removing the appendix, investigated the stomach, duodenum, and gall-bladder. There was no evidence of old or recent ulceration; the stomach was normal in size and the gall-bladder empty. The appendix showed evidence of old and recent inflammation, and there were a few adhesions in the pelvic region. The appendix was removed and the wound closed.

When the patient recovered from the anæsthetic the first thing he noticed was the absence of the pain, and it has not returned. He is now eating ordinary diet, and the change in his appearance is remarkable, for with so many different opinions he had made his own diagnosis of cancer, and removal of this fear has changed his whole mental outlook. Years ago I had a case of a somewhat similar character in which the pain was over the left nipple area. The patient, a young officer, had consulted me for heart disease, and, having in mind the old saying, "If a man complains of his heart think of his stomach," investigation of his digestive region soon revealed a chronic appendix, removal of which at once relieved the præcordial pain.

Reviews and Notices of Books.

REJUVENATION AND THE PROLONGATION OF HUMAN EFFICIENCY.

By Dr. PAUL KAMMERER. London: Methuen and Co., Ltd. 1924. Pp. 252. 8s. 6*d*.

THE subject of rejuvenation and the question whether human efficiency can be prolonged by artificial means are of overwhelming interest to the outside public as well as to the medical profession. The search for the elixir of youth is an old one, and the press has not been slow to seize on and to exploit the dramatic interest of Steinach's work. As a result much misrepresentation has occurred, with consequent discredit to what is undoubtedly a praiseworthy piece of physiological research. A book suitable for the general public, which conveys the limitations as well as the possibilities of Steinach's method of rejuvenation, should thus prove of service. Dr. Paul Kammerer has collaborated with Steinach in the past and has an intimate knowledge of his work and personality. His exposition of the subject includes a consideration of the processes of ageing, a brief survey of the part played in these processes by the endocrine glands, and of the results obtained in the laboratory from ligature of the vasa of aged rats. Dr. Kammerer then proceeds to record the results obtained in human beings. He is of the opinion that already sufficient evidence has accumulated to allow of a favourable verdict being given, although with Harms he is prepared to reserve opinion as to whether the operation can affect exhausted nervous tissue. His view is that rejuvenation must act by making it possible for a man to die from normal senility, whereas according to Nothnagel's estimate only 1 in 10,000 dies from such a cause. So confident is he of the genuine nature of the results obtained from vaso-ligature in the human being that he considers it worth while to discuss such questions as the morality of the proceeding and its effect on the community. Surely such questions are a little premature? Whilst we are prepared to admit the interest of Steinach's research, we can hardly feel satisfied, as Dr. Kammerer appears to feel, that the operation as applied to man has already justified itself. On the whole, although instances of decided improvement following the operation have been recorded, the results in man have been far less striking than those obtained in rats by Steinach at Vienna, and Machts in America. We must therefore remain amongst those "super-cautious people" mentioned by the author, who hesitate to generalise hastily. On the whole, however, Dr. Kammerer has given a fair and restrained review of the subject.

OPERATIVE SURGERY.

By WARREN STONE BICKHAM, M.D., F.A.C.S., former Surgeon in Charge of General Surgery, Manhattan State Hospital, New York; former Instructor in Operative Surgery, College of Physicians and Surgeons (Columbia University), in the New York Post-graduate Medical School and Hospital, and in the New York Policlinic Medical School and Hospital. Vol. III. London: W. B. Saunders Company, Ltd. 1924. Pp. 1001. 50s.

THE third volume of this large work resembles in scope and arrangement the two volumes already published. Unlike many treatises on operative surgery, it contains full descriptions of operations upon the ear, nose, throat, and eye. The author explains in his preface that in including these he hopes to assist those practitioners whose work lies in centres where specialists are not available. Besides an account of these special subjects this book gives descriptions of operations upon the head, neck, and thorax, so covering extensive ground. Many procedures are described which are not to be found in the usual text-books of operative surgery, and the surgeon who consults this work will get assistance in

The patient was discharged from the hospital, but died on Jan. 11th, 1924, and it was then confirmed by post-mortem examination that the dull area of the right chest which revealed pulsation and systolic murmur was due to a greatly and horizontally dilated left auricle, the chamber containing 1½ pints of blood.

Post-mortem Examination by Mr. W. G. Barnard.

"There are general hypertrophy and dilatation of all the chambers of the heart, which measures 7½ × 8½ × 4 in. The left auricle is dilated out of proportion to the other chambers, and at the post-mortem examination held 30 oz. of blood; it measures 5½ × 7 × 4 in. and extends laterally from the hilum of the left to the hilum of the right lung and from the arch of the aorta above, to within two inches of the apex of the heart below. The arch of the aorta and the bifurcations of the trachea have both been displaced upwards. The pressure collapse of the free border and lower lobe of the right lung can be seen. The parietal and the visceral layers of the pericardium are adherent universally. There are considerable thickening and rigidity of the free borders of the mitral valve which have fused to form a crescent-shaped opening which will barely admit the tips of two fingers." Microscopic sections of the wall of the left auricle failed to show the presence of any organism.

Comment.

The original account of this condition made a clinical diagnosis possible, for it clearly showed that the left auricle is capable of dilating horizontally to the right, and capable of producing dullness to percussion and pulsation in the upper and outer part of the front of the right chest. Another fatal case producing similar dullness was described by Dr. J. G. Emanuel[2] in March of last year.

I have under observation another case seen with Dr. C. Wyndham Gittens occurring in a woman, aged 60 years, who during the earlier stages of the malady, whilst under observation at the Brompton Hospital, showed by X rays (Dr. Stanley Melville) a limited dark area to the right of the cardiac shadow which I concluded was due to mediastinal growth; later on the above-mentioned dark area gradually increased in size, according to X ray examination. Quite recently it was possible to notice dullness to percussion reaching continuously from the heart outwards beneath the right pectoralis major, the upper margin of which was the third rib, and in the fourth intercostal space beneath the same muscle pulsation could be defined, synchronous with the apex beat; the pulsation reached into the right axilla. The Wassermann test was negative, and although it is impossible to find a history of rheumatism, or signs of mitral disease, it seems very probable that this patient is also suffering from horizontal dilatation of the left auricle to the right border of the chest.

RUPTURE OF TUBO-UTERINE GESTATION,

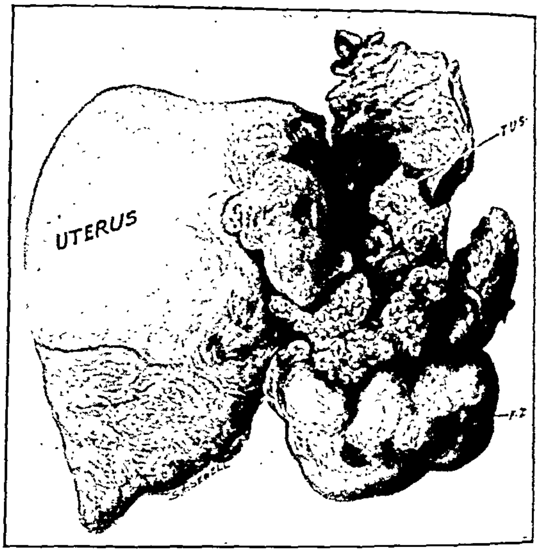
WHICH WAS CONCURRENT WITH INTRA-UTERINE PREGNANCY.

BY W. GIFFORD NASH, F.R.C.S. ENG.,
SURGEON TO THE BEDFORD COUNTY HOSPITAL.

I HAVE now met with three instances of tubo-uterine gestation. The first patient,[3] in whom the sac had been ruptured three days, died after hysterectomy. The other two recovered. In the second case[4] I was able to resect the sac and save the uterus. A year later this patient had a normal labour. The following is a record of the third case:—

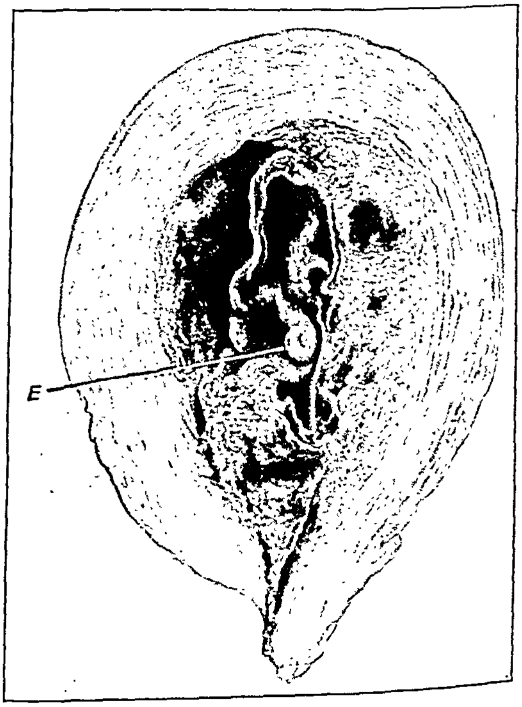
Mrs. A., aged 31, was admitted to the Bedford County Hospital on June 12th, 1923. She had two children, aged respectively 3 years and 13 months. Nine weeks had elapsed since her last period. On June 11th she had a sudden attack of severe pain in the right lower abdomen, followed by nausea, vomiting, and fainting. On admission to hospital she was very collapsed with a pulse of 136. The abdomen was distended and rigid. Immediate operation was decided on and a medium incision was made below the umbilicus. There were much blood and clots in the lower abdomen. A ruptured sac with projecting membranes was found at the right upper corner of the uterus, and this occupied so much of the uterine wall that it appeared impossible to excise it. Supravaginal hysterectomy was performed. Recovery was delayed by a *B. coli* infection of the right kidney, which necessitated residence in hospital for eight weeks.

FIG. 1.



Showing wall of tubo-uterine sac and chorionic tissue.
T.U.S. = Tubo-uterine sac. F.T. = Fallopian tube.

FIG. 2.



Longitudinal section of the uterus showing fœtal membranes and embryo (E).

Description of Specimen Removed.

The uterus is irregularly enlarged to about the size of a ten weeks pregnancy. The right ovary appears to be normal. The right Fallopian tube is rather short and thick and can be traced entire up to its junction with the here brought together, giving all the most modern methods and representing a huge amount of work of the highest class. The question of a developmental cycle of the spirochæte is discussed, especially the phenomena of granulation, and the author contents himself with setting down the evidence and leaving the question undecided. The same is true of the question of a neurotropic strain of the organism. The complement-fixation test is discussed fully and fairly, and its significance and limitations pointed out. The precipitation test is also exhaustively dealt with, with special reference to the Sachs-Georgi test. The chapter on the cerebro-spinal fluid by Dr. Cruickshank is well written and gives concisely modern methods of examination and interpretation. The chapter by Dr. Taniguchi on the nature of the syphilitic antibody is admirable and stimulating.

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[2] THE LANCET, 1923, i., 591.
[3] THE LANCET, 1905, ii., 593.
[4] Ibid., 1917, ii., 122.

The second part of the work on treatment is sound and moderate in tone, making no fantastic claims for results. Dr. Mackenzie gives fully the scientific data that led up to the use of salvarsan remedies, and enters fully into the question of untoward results of its administration. The author appears to under-estimate the results to be expected from the treatment of tabes, and gives little hope of any effect of treatment of general paresis. No mention is made of the malaria treatment. It is matter for regret that the writer has not devoted a chapter to the use of bismuth, which has now a definite place in therapy of syphilis alongside salvarsan derivatives and mercury. A fuller discussion on tests of functional liver inefficiency, in the attempt to avoid destruction of liver cells by the arsenical preparations, would also have been welcome. The introduction to the work by Prof. Muir is an admirable piece of writing—a monograph in itself, completing an excellent scientific treatise which reflects credit on the authors and their collaborators. In the list of references no recent article of value in the realm of syphilis seems to have been omitted.

Every clinical and laboratory worker in syphilis should buy this work, read it carefully, and then keep it for reference.

ÉTUDES MÉDICO-CHIRURGICALES SUR LE DUODENUM.

By PIERRE DUVAL, JEAN CH. ROUX, and HENRI BÉCLÈRE. Paris: Masson et Cie. 1924. Pp. 269. Fr.35.

THE duodenum and the viscera in close relation to it constitute a field of growing importance to the surgeon and radiologist, and Duval's clinic affords an unparalleled opportunity to both. The radiologist particularly will welcome the work under review, and if it does not solve all the problems that an attentive study of this region provides, it will certainly help the observer to systematise his ideas.

The book deals with the following subjects: (1) The duodenum in biliary lithiasis; (2) stenosing idiopathic periduodenitis; (3) compression by the mesenteric pedicle; (4) duodeno-jejunostomy; (5) duodenal ulcer; and (6) intoxication in duodenal stasis. Each section is well worked out in considerable detail. Forty pages, for example, are given to the subject of compression by the mesenteric and middle colic arteries. The diagrams and descriptions of this condition and of the operations undertaken for its relief are clear and useful. The section on ulcer follows Akelund's work in its general lines. The skiagrams made by the serial method are well reproduced, but it is doubtful if any useful purpose is served by giving fanciful names to duodenal deformities in view of the fugitive and essentially variable appearances of barium food in the duodenum. We must condone this fault, to which the authors are rather prone, in view of their careful study of the underlying pathological condition. The unpleasing method of writing descriptive lettering across blocks, which has been growing more common of late, has happily been avoided by the use of neat marginal explanatory diagrams.

The work is an important one, written as it is in close collaboration by a physician, a surgeon, and a radiologist, working at the same clinic with abundance of clinical material. It will appeal to all three branches in this country, if most strongly to the radiologist.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE. July and August.—Interesting facts are given in the July issue by C. O. Sappington when reporting on five years' sickness and accident experience in the Edison Electric Illuminating Co. of Boston. Common colds caused 34·3 per cent. of absenteeism, with a case-rate of 47 per 100 employees, and an average loss of 3·2 days per case. Among women dysmenorrhœa came second, with a rate of 32 per 100. For severity functional nervous diseases headed the list with an average loss of 9·4 days per case; rheumatism, arthritis, and gout came second, with an average loss of 7·4 days. Those affections which made up the bulk of the number of cases were lowest in severity rates, but their aggregate amount of lost time was greatest. A progressive decrease in rates was found as age increased—quite an unusual phenomenon. Women experienced more absenteeism than men. The average case cost was lowest for diseases of the stomach and highest for occupational accidents; home accidents had a high case cost, but only half that of occupational accidents. Sickness caused 20 times as many cases of absenteeism as accidents and seven times as much lost time. The plea put forward in THE LANCET (1921, i., 985) for closer study of the common cold is quoted and supported. —In contrast H. E. Elkind deals with mental hygiene in large mercantile establishments in Boston. Here functional nervous disease cost much more than rheumatism, arthritis, and gout taken together with the common cold. The results obtained by applying psychological tests are given; some positive association was found between native intelligence and clerical ability.—E. Ciampolini draws attention to carbon monoxide hazard in public garages. The blood of a number of men was examined and in 70 per cent. traces of CO were found; headache was common, and gastric symptoms were present in many. Atmospheric tests showed the presence of CO in 77·5 per cent. of garages inspected, amounting to 0·2 per cent. in one case and to 0·15 per cent. in nine. Ventilation was as a rule quite inadequate. Clearly carbon monoxide is a definite risk in garages. ——The issue for August is devoted entirely to experimental studies in lead absorption. A. S. Minot finds that after giving lead acetate to cats by mouth it is absorbed into the circulation only in small amounts; the liver protects the rest of the organism, and most of the lead is excreted in the bile; a small amount reaches the various tissues; bones show a special affinity for lead, and retain it when the other tissues may be clear; in bones lead is a harmless deposit; lead does harm during transport rather than during storage. In a second paper the same author points out that lead compounds when insufflated escape the protective action of the liver and so are rapidly distributed through the organism. Given subcutaneously absorption is so slow as to be of little practical importance.—A. S. Minot and J. C. Aub give the result of analyses of the various tissues of seven patients with known histories of exposure to lead. The findings resemble those found in experimental animals. While symptoms are present lead is distributed generally. After exposure has ceased there is selective localisation in temporarily harmless skeletal deposit.—L. T. Fairhall and C. P. Shaw report on a research into the deposition of lead salts in bone. Lead is quantitatively removed from solution in a short time by crushed bone, where it appears to replace calcium and to exist as a phosphate. The hypothesis is that lead is deposited by a process of adsorption of colloidal lead salts.

almost any operation which he may be called upon to perform. This is an attractive feature. One of the best sections is that which treats of the thorax. Curiously, in an almost encyclopædic work of this description there is no account of Lilienthal's successful case of resection of the thoracic œsophagus, nor of Torek's classical case. On p. 661 there is a small inaccuracy. Jonnesco's operation upon the sympathetic for exophthalmic goitre includes the removal of the inferior cervical and the first thoracic ganglia. It is rather important to emphasise this, since it has been demonstrated that the nerves which influence the activity of the thyroid come almost solely from the inferior ganglion. In a long book it is safe to say that no points stand out for serious adverse criticism. The high level attained in the previous volumes has been maintained.

DISEASES OF WOMEN.

Third edition. By Ten Teachers. Under the direction of COMYNS BERKELEY, M.D., M.C. Camb., F.R.C.P. Lond., Obstetric and Gynæcological Surgeon to Middlesex Hospital. London: Edward Arnold and Co. 1924. Pp. 641. 24*s*.

THE appearance of a third edition of this text-book within five years of its first publication is an index of the esteem in which it is held. It has filled adequately the need for a concise and handy volume dealing with the pelvic ailments of women. In 600 odd pages the book provides a clear exposition of the views of ten well-known London teachers of gynæcology welded into one composite whole under the editorship of Drs. Comyns Berkeley, Russell Andrews, and J. S. Fairbairn. The present edition follows in general lines its predecessors, and minor alterations only are noticeable. For example, the section on adenomyoma is brought up to date, and we notice for the first time the introduction in a student's text-book of the new term Endometrioma in relation with extra-uterine neoplasms of this character. The book does not profess to be exhaustive, but it is ample for the student's requirements. The practitioner also will find much sound information in its pages. A section likely to be particularly useful to the man in practice is that dealing with chronic ill-health in women from the psychological aspect. Neurasthenia in relation to pelvic disorders is only too common, and the chapter which discusses this problem is admirable.

We note that the sections on urinary disorders and intestinal disorders are still retained. In a text-book devoted primarily to the diseases of women it would appear hardly necessary to discuss at length the course of acute and chronic appendicitis—conditions which are so thoroughly considered in works on general surgery. And the completeness with which such rare conditions as inversion of the uterus are treated seems out of place in a text-book of this type. The same may be said of rhabdomyosarcoma of the uterus, interstitial pregnancy, and the technical details of such operations as trachelorrhaphy and amputation of the vulva. The man who reads this book will not perform these operations. If he does he will require more experience than can be gained from woodcuts, however excellent. The student without experience is unable to distinguish between the common and the rare, and too often lays undue emphasis upon impressions gained from text-book illustrations.

The book will continue to occupy its deservedly high place amongst the gynæcological text-books of to-day. Its popularity should be enhanced owing to the reduction in price.

MATTER AND CHANGE.

An Introduction to Physical and Chemical Science. By WILLIAM CECIL DAMPIER WHETHAM, M.A., F.R.S., Fellow and sometime Senior Tutor of Trinity College, Cambridge. Cambridge: At the University Press. 1924. Pp. 280. 7*s*. 6*d*.

THIS book, which is written for the general reader and for those whose main intellectual interests lie in other fields of thought, fulfils its purpose excellently. Few modern activities are possible without some knowledge of the basal sciences of chemistry and physics, but progress in these is so rapid that a very few years abstinence from their study renders the outsider hopelessly out of date. The ordinary text-books of chemistry and physics are laden with detail, and it is a labour to read them save for the direct and numerous purposes which they serve, but in Mr. Whetham's book detail is subordinated to essentials and general principles. The author discusses the main branches of his subjects clearly and philosophically. He has ruthlessly discarded a great deal of material which goes to make up the bulk of the ordinary text-book, and in consequence the general reader is not distracted from the appreciation of the important, fundamental principles. Of their charity, mathematicians and physicists are apt to flatter their readers, and it may be doubted whether the more biologically minded individual will agree that Mr. Whetham employs only "the simplest schoolroom mathematics." But even if some of the equations at first sight look rather terrifying, the author has really been lenient, and we can thoroughly recommend his book to the medical man who desires, not only to keep abreast of other sciences than his own, but also to appreciate the direction of modern medical research.

VENEREAL DISEASE.

Lectures on Gonorrhœa in Women and Children. By J. JOHNSTON ABRAHAM, M.D. Dub., F.R.C.S. Eng.; Surgeon, London Lock Hospitals; Senior Surgeon, Kensington General Hospital. London: William Heinemann, Ltd. 1924. Pp. 142. 7*s*. 6*d*.

THIS book, in the form of nine lectures, gives as brief a description as possible of the usual manifestations, immediate and remote, of gonorrhœa in women and children in order to dwell more particularly on the treatment of the various conditions. The arrangement of the matter is admirable and the author has succeeded wonderfully well in bringing before the practitioner the methods of treatment in a concise and definite form. As is natural in so small a book, certain instructions are laid down dogmatically, which in a larger work would be matter for discussion, but the lines of treatment set forth are sound.

The book is needed in this country and in our colonies. While much literature has accumulated in recent years on the subject of gonorrhœa in the male, little has been written of the disease in the female, and the information here given, unfortunately not well illustrated, will aid the practitioner materially in his treatment of the disease.

The methods of examination set down are sufficiently exact and the same is true of the tests for cure. Practitioners will find this is a valuable little book.

Recent Methods in the Diagnosis and Treatment of Syphilis. Second edition. By CARL H. BROWNING, M.D., D.P.H., and IVY MACKENZIE, M.A., B.Sc., M.D. Part I.: Diagnosis. Revised by CARL H. BROWNING, with chapters by JOHN CRUICKSHANK and T. TANIGUCHI. Part II.: Treatment. Revised by IVY MACKENZIE. With an introduction by ROBERT MUIR, M.D., F.R.S., Professor of Pathology in the University of Glasgow. London: Constable and Company, Ltd. 1924. Pp. 537. 42*s*.

THE first edition of this work appeared in 1911, when the modern lore of syphilis was in its infancy. Since then the literature on the subject has reached enormous proportions. On that account, and with wisdom, the subject-matter has been divided into two parts: I., "Diagnosis," for the rewriting of which Prof. Browning is responsible, and II., "Treatment," which Dr. Mackenzie has undertaken. The matter in the volume is original and has previously appeared in scientific journals; it is practically new, and is

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 6, 1924.

THE UNIVERSITY OF LONDON PARLIAMENTARY ELECTION.

THE untimely and regretted death of Sir SYDNEY RUSSELL-WELLS has brought about unexpectedly, and at an interesting period in the history of the University of London, a Parliamentary election, and already there are three candidates in the field whose claims in respect of the University can be gauged by their public utterances and records, although so far all the formal election addresses have not been issued. The three candidates, each of whom may be said to place the interests of higher education above party considerations, are Sir JOHN ROSE BRADFORD, officially a Conservative, Dr. E. GRAHAM LITTLE, an Independent candidate, and Prof. A. F. POLLARD, officially a Liberal; and two points present themselves for decision to the minds of the electors. The first is, whether they will allow party considerations to decide their vote; and the second is, whether subordinating party considerations to the promotion of educational interests—a position which every University elector has a right to take up—they approve or disapprove of the reconstruction of the University of London, as foreshadowed in the recommendations of the Haldane Report. For here those who invite their suffrages are at variance. The intention of the Board of Education to set up a Departmental Committee to consider this Report is the reason given by Dr. LITTLE for his candidature, the assumption being that his opponents will not be adverse to such a Committee being set up, and that its formation implies a new constitution for the University on the lines of the Report. Dr. LITTLE is in entire opposition to the Report, while the other candidates, without endorsing all its recommendations, see the necessity for certain changes which it advocates. The wording of the reference to the Departmental Committee has not been studied by some of the partisans who have made public utterances. It is as follows: "To consider the Final Report of the Royal Commission on University Education in London dated the 27th March, 1913, and, having regard to present circumstances and after consultation with the persons and bodies concerned, to indicate what are the principal changes now most needed in the existing constitution of the University of London and on what basis a Statutory Commission should be set up to frame new Statutes for the University." The action of the Board of Education in setting up the Departmental Committee has been challenged on a hazy understanding of the programme which will lie before that body, it being taken for granted that to consider the Final Report would be to bless it and put it into force.

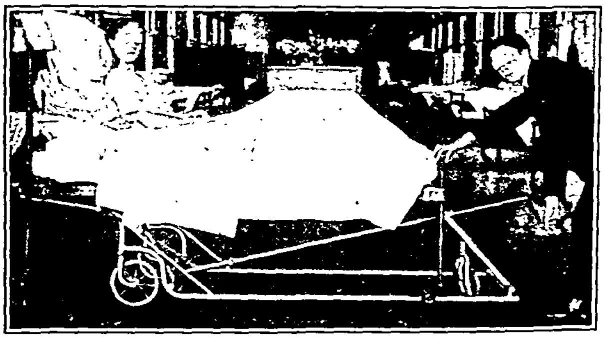
Of the three candidates it is extremely pleasant to be able to say that they are personally unexceptionable. They can express diverse views on the honest and strong foundation of an intimate knowledge of what they are talking about. Each believes that he represents the right, and this should ensure for the contest close attention from all those of our readers who are interested in higher education, whether electors or not, for fundamental matters in professional training will be on the carpet. Those who believe that the recommendations of the Haldane Report, if carried into effect, would damage the University irretrievably by creating a bureaucratic Senate, and by exalting the teaching colleges at the expense of the external students, will give their votes to the candidate who sees no good in a further inquiry into the constitution of the University. But the new Committee may not, in the altered recommendations that they are certain to make, take the course which has been anticipated by those definitely opposed to the Haldane Report—surmises even when supported by plausible arguments remain surmises. Dr. LITTLE, explaining his candidature as due to the revival by the Government of the recommendations of the Haldane Report, comes forward on the invitation of the University of London Graduates' Association, which is a non-political body, but makes a first-class point for a Conservative platform in suggesting that, as the present state of the University calls for no drastic alterations, there is no need for doing anything. Sir JOHN ROSE BRADFORD is opposed to a Statutory Commission carrying out the recommendations of the Haldane Report, and has modified a previously expressed view as to the abolition of external medical degrees. Prof. POLLARD, forecasting the results of the new Departmental Committee, has stated that he is not in favour of abolishing degrees, granted only on examinational tests, until their place can be taken by something which the student needs and desires more. He comes to the heart of the situation as it affects the medical profession in particular. The constitution of a smaller Senate, or the development of one of the internal colleges to be a centre around which the University revolves, would create situations which are more remote to the interests of the external student than the curtailment or abolition of the right to obtain degrees by examination, without affiliation to a teaching body. This has been the great privilege of the University of London. Its function as an Imperial examining board has been its pride throughout the existence of the University, and it can easily be understood that any attempt to tamper with the privilege arouses stalwart opposition. Yet that privilege was a gift to meet a time, not to satisfy perpetual requirements. Undoubtedly great men and successful men, and some who have been both great and successful, have owed their positions to the extraordinary facilities offered by the University of London for independent and private study, but if those opportunities, which have worked so well in the past, can be replaced by opportunities as wide and as wise, but more in touch with the present, there can be nothing sacrilegious in interference, though justice and prudence would suggest that the interference should be made with all possible respect for existing rights.

General pictures have a way of not being accurate, owing to a necessary absence of detail, and the situation cannot be summed up by saying that we have here a contest between those who think that the function of the University is to train learned men and those who think that the function of the University is to train useful citizens; and yet some such parting of the ways is held by the supporters of the various candidates to be in contemplation. Of course, the function of a university is to do both things, and that is what makes the medical graduate so typical a figure, his academic ideals and his social utility being limited only by the progress of science. Now medicine differs from other callings in the absolute necessity which its pursuit entails upon the student that she or he should receive instruction in an approved school in order to meet examinations whose standard is

New Inventions.

A BED-LIFTING TROLLEY.

To transfer a patient on a trolley from his bed to the operating theatre and back again necessitates several liftings, at least four: (1) If a preliminary injection of morphine has been given, this disturbs the patient and interferes with the action of the drug; (2) if the patient is in pain the lifting may cause a great deal of suffering and even shock; (3) if the operating theatre is at some distance from the ward the patient is liable to suffer from exposure to cold during his journey. I am persuaded that this exposure is a potent factor in the causation of post-operative lung affections. To minimise these disadvantages the patient is often brought to the theatre in his bed, but unless the bed is provided with large wheels, the procedure is not always a simple one. I have therefore designed an appliance which has been tested for several months. The principle of the mechanism is that of an oblong box from which the top and bottom have been removed and the sides fastened together by hinges. It is obvious that by pressing together two opposite edges the whole will collapse. Imagine, passing diagonally across the box, a rod provided with a screw and so mounted that when it is turned in one direction the box will collapse, and when it is turned in the other, the box will resume its rectangular shape. The actual apparatus is shown in the illustration. It consists of an undercarriage provided with three movable wheels, so arranged that the apparatus can be turned in its own length. At either end of this are hinged the supports of a stretcher top (which can be made a separate piece if one wishes). This is raised and lowered, by a diagonal screw, acting in exactly the same way as in the case of the box. When the screw is turned one way the stretcher is lowered so that it can be slipped under the patient's bed; when the handle is turned in the opposite direction the stretcher is raised, carrying the bed with it. Patient, bed, and trolley can now be easily wheeled to the operating theatre; and, after the anæsthetic has been administered on the bed, the patient can be brought to the side of the table and lifted on to it. If the head of the bed gets in the way of the anæsthetist before the morphia is given the mattress can be readily turned round head to foot. During the operation the bed can be warmed and after the operation the patient is lifted back from the table to his bed. Not only are two liftings definitely eliminated, but the remaining two, being carried out in the theatre, where there are usually many hands to help, are done more gently, and there is no risk of the patient being "bumped" back into bed. With this apparatus it is possible to bring a bed to the casualty receiving room for cases of severe injury or internal hæmorrhage; and in the case of chronic cases it can be used to wheel a patient in his bed about his house or grounds. It can, of course, be used as an ordinary theatre trolley. The apparatus is the result of a good deal of experiment, and I should like to thank Messrs. Arnold and Sons, of Wigmore-street, for their skilful coöperation and assistance. It is made of steel tubing and is extremely strong and at the same time light.



ARTHUR EDMUNDS, C.B., M.S., F.R.C.S.,
Surgeon to King's College Hospital.

Reports and Analytical Records.

AMBRIODIN CENTAUR.

(THE CENTAUR CHEMICAL CO., LTD., BASSISHAW HOUSE, BASINGHALL-STREET, LONDON, E.C. 2.)

SOME years ago we published the composition of this compound as ammonium bromide 5 gr., potassium iodide 1 gr. combined with a laxative, and these are the ingredients given in the analysis published by the Centaur Chemical Company. The formula is therefore well known to medical men as of use when bromide is indicated, and the tablets offer a convenience in administration. Advantages are claimed in the treatment of epilepsy by this combination as opposed to the exclusive use of potassium bromide, and clinical evidence is forthcoming in support of the claim. Each tablet contains ammonium bromide 0·324 g., potassium iodide 0·0648 g. with suitable laxatives and tonics, and from two to six tablets are recommended to be taken twice daily, the dosage and time of administration obviously to be under the direction of the physician. Medical men have also found the preparation of use in general depression, irritability, and the conditions rather loosely included under the term of neurasthenia. Here the recommended dose is smaller, and the employment of the remedy must be watched and the dosage varied according to the effects produced. The tablets are supplied sugar-coated or uncoated, the latter undergoing ready solution in the stomach.

PREPARED FOODS.

(MESSRS. GEORGE KING AND CO.'S FOODS, ALBION FOOD MILLS, SYCAMORE-STREET, LONDON, E.C.1.)

Three foods manufactured by this firm have been submitted to us for examination: (1) Wheaten food; (2) prepared patent cooked oatmeal (Scotch), medium grind; (3) prepared patent cooked oatmeal (Scotch), fine grind. When analysed these were found to have the composition :—

—	Wheaten food, per cent.	Oatmeal, medium grind per cent.	Oatmeal, fine grind, per cent.
Moisture	4·0	3·3	3·8
Mineral matter ..	0·6	2·0	1·9
Fats	1·4	10·5	10·0
Protein	12·3	11·2	12·6
Carbohydrates and cellulosic matter	81·7	73·0	71·7
Matter soluble in cold water ..	10·8	4·8	6·0
Calorie value, per lb.	1807	2010	1989

The wheaten food is ordinary flour of a good grade which has been cooked or heated sufficiently to destroy its gluten-forming capacity, and incorporated with it is a small amount of a finely ground malted cereal. Evidence of this is afforded by the presence of a starch-liquefying diastase. According, however, to the instructions provided for preparing the food, the malt can play no part in converting the starch of the wheaten flour into soluble sugars. Many practitioners, therefore, would deprecate this food being given at so early an age as 5 months.

Oatmeal (medium and fine grind): These are de-husked oatmeals of a high grade which have been submitted to a preliminary cooking process in order to save time in preparing them for the table. The analytical figures are those usually found for good Scotch oatmeals. It will be noted that the percentage of fat is much higher than in the wheaten food. This is characteristic, and is one of the principal reasons why oatmeal is so valuable a food material.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 6, 1924.

THE UNIVERSITY OF LONDON PARLIAMENTARY ELECTION.

THE untimely and regretted death of Sir SYDNEY RUSSELL-WELLS has brought about unexpectedly, and at an interesting period in the history of the University of London, a Parliamentary election, and already there are three candidates in the field whose claims in respect of the University can be gauged by their public utterances and records, although so far all the formal election addresses have not been issued. The three candidates, each of whom may be said to place the interests of higher education above party considerations, are Sir JOHN ROSE BRADFORD, officially a Conservative, Dr. E. GRAHAM LITTLE, an Independent candidate, and Prof. A. F. POLLARD, officially a Liberal; and two points present themselves for decision to the minds of the electors. The first is, whether they will allow party considerations to decide their vote; and the second is, whether subordinating party considerations to the promotion of educational interests—a position which every University elector has a right to take up—they approve or disapprove of the reconstruction of the University of London, as foreshadowed in the recommendations of the Haldane Report. For here those who invite their suffrages are at variance. The intention of the Board of Education to set up a Departmental Committee to consider this Report is the reason given by Dr. LITTLE for his candidature, the assumption being that his opponents will not be adverse to such a Committee being set up, and that its formation implies a new constitution for the University on the lines of the Report. Dr. LITTLE is in entire opposition to the Report, while the other candidates, without endorsing all its recommendations, see the necessity for certain changes which it advocates. The wording of the reference to the Departmental Committee has not been studied by some of the partisans who have made public utterances. It is as follows: "To consider the Final Report of the Royal Commission on University Education in London dated the 27th March, 1913, and, having regard to present circumstances and after consultation with the persons and bodies concerned, to indicate what are the principal changes now most needed in the existing constitution of the University of London and on what basis a Statutory Commission should be set up to frame new Statutes for the University." The action of the Board of Education in setting up the Departmental Committee has been challenged on a hazy understanding of the programme which will lie before that body, it being taken for granted that to consider the Final Report would be to bless it and put it into force.

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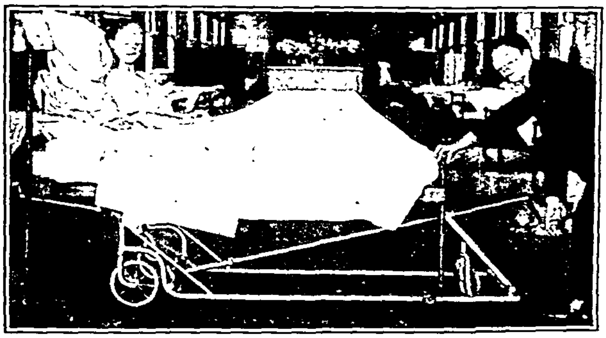

ARTHUR EDMUNDS, C.B., M.S., F.R.C.S.,
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Moisture	4·0	3·3	3·8
Mineral matter ..	0·6	2·0	1·9
Fats	1·4	10·5	10·0
Protein	12·3	11·2	12·6
Carbohydrates and cellulosic matter	81·7	73·0	71·7
Matter soluble in cold water ..	10·8	4·8	6·0
Calorie value, per lb.	1807	2010	1959

The wheaten food is ordinary flour of a good grade which has been cooked or heated sufficiently to destroy its gluten-forming capacity, and incorporated with it is a small amount of a finely ground malted cereal. Evidence of this is afforded by the presence of a starch-liquefying diastase. According, however, to the instructions provided for preparing the food, the malt can play no part in converting the starch of the wheaten flour into soluble sugars. Many practitioners, therefore, would deprecate this food being given at so early an age as 5 months.

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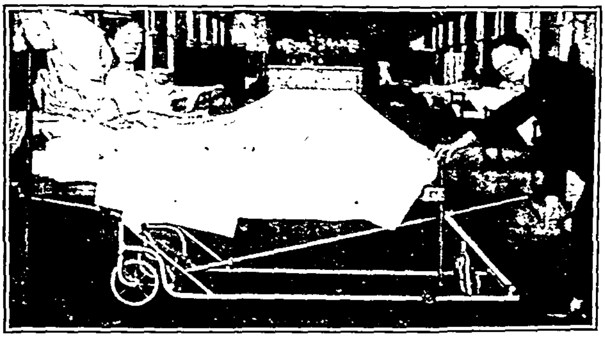

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almost complete arrest of hostilities is a matter of common knowledge. Within six months of that period the ordinary business of life was in many parts of the world temporarily brought to a standstill by the ravages of the disease; in North America the coffin-makers were unable to cope with the demands for their wares; whilst in tropical Africa, Asia, and the Oceanic Islands natives in unknown thousands crawled into the forests to die.

To-day little more is known concerning the agency responsible for these dramatic occurrences than was available at the moment when the document on "three-day fever" was originally drafted. Rival bacteriologists may sometimes indulge in learned disputes on the subject, but no man can say with absolute authority whether certain diseases, such as encephalitis lethargica, are entirely unrelated to influenza. Without suggesting that it is in any way probable, we can say that it is a possibility that minor epidemics such as that recorded in the article in our columns to-day bear some relation to pandemic influenza. The possibility gives an important incentive to efforts to discover their true pathology.

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A STATISTICAL REVIEW OF 1923.

THE Registrar-General has issued, in the third week of August, his medical tables [1] for the previous year, and, alongside the statistical "records" which this review contains, should be gratefully noted the timeliness of its appearance. For the tables are of great importance to executive health officers as the basis for their local reports, while last year the review was given out in November, in the previous year not at all. The edge of the interest has been tken off these truly wonderful vital statistics by the forecast issued in January,[2] when the Registrar-General remarked that the birth-rate for England and Wales as a whole was (apart from the war years) the lowest recorded, while the death-rate and infantile mortality were actually the lowest on record. His provisional figures have undergone no substantial modification, the corrected birth-rate for 1923 being 19·7, the death-rate 11·6, and the infant mortality-rate 69. From the figures now given it appears that the actual number of births was 758,131 (or 21,993 fewer than in 1922), the actual number of deaths 444,365 (or 41,864 fewer than in 1922), leaving a plus balance of 313,766, equivalent to a rate of 8·1 per 1000 living, denoting the natural increase of population. This increase shows a higher rate (the Registrar-General calls it an "improvement") than in 1922, when the rate was 7·6 per 1000. The deaths in 1923 were, in fact, little more numerous than in 1862, when the population was hardly over 20,000,000 and the death-rate was 21·4; now it has fallen below 12 per 1000 for the first time. The infant mortality-rate of 69 is a measure of deaths under 1 year of age amounting to 52,582, an appalling enough figure when stated in this form. The mortality of children of school age has also reached its lowest record. In regard to infectious diseases, the death-rates from enteric fever, diphtheria, and phthisis are the lowest on record, as also (with one exception) is that from scarlet fever. Influenza shows the lowest mortality since 1917 and whooping-cough since 1919. Cancer, in the unvarnished words of the report, "shows the highest rate yet received"; the total figures, and those which we have given week by week in our summaries of health officers' reports, denote a vast amount of unrelieved misery which weighs heavily upon medical science. We hope it will not be long before we receive Dr. Stevenson's illuminating commentary upon this compendium, which should in the meantime be studied in the light of Sir George Newman's cautionary tale issued by the Ministry of Health.

Annotations.

"Ne quid nimis."

A GREAT MUNICIPAL HEALTH OFFICER.

DR. E. W. Hope's impending retirement from the position of medical officer to the City and Port of Liverpool severs a very intimate connexion. His tenure of office has been synchronous with the great activity in public health matters which has been in progress since the passing of the Public Health Act of 1875. Liverpool was a pioneer in municipal hygiene. The first medical officer of health in England, Dr. W. H. Duncan, was appointed there in 1842. His successor, Dr. W. S. Trench, was followed in turn by Dr. Stopford Taylor, to whom, in 1883, Dr. Edward W. Hope was appointed assistant. In 1887 Dr. Hope became medical superintendent of Park Hill Fever Hospital, and in 1894, on the retirement of Dr. Taylor, he was appointed medical officer of health of the city.

From early days Dr. Hope was associated with the University movement; in 1886 he became lecturer on public health to University College, and subsequently was appointed professor of public health, first at the College when it was affiliated to the Victoria University, and latterly at the University of Liverpool, when it obtained its charter in 1903. Dr. Hope has frequently pointed out that the unenviable notoriety for disease and mortality which characterised Liverpool at the time of his appointment was due in large measure to the rapid growth of the city at a time when public health requirements were disregarded, and in the second place to its peculiar vulnerability to the attacks of imported disease. In 1883 the city had no hospital for infectious diseases, and there was practically no port sanitary administration to check the importation of exotic disease. The great needs of Liverpool necessitated a forward policy, and under the wise guidance of Dr. Hope the city council repeatedly obtained special legislative powers, while utilising to the full the provisions of the public health measures applying to the whole country. When Dr. Hope took office the population of Liverpool was only 540,000; in 1921 it had increased to 817,000, but the total deaths in this larger population were less by nearly one quarter. During this period housing received much attention, for in 1883 there were 23,690 cellars occupied as human dwellings and sanitation was in other respects in a very backward state. In the late 'eighties Liverpool was one of the few places where typhus fever could still be studied. During Dr. Hope's connexion with the city there have been built up a system of hospitals for infectious disease, an efficient and elaborate port sanitary administration, and all the other essentials of a modern civic health department, including an up-to-date school medical service and maternity and child welfare department.

Throughout his work as municipal officer Dr. Hope never came into conflict with independent medical practice. The good feeling existing between him and his medical colleagues found expression in his election some years ago to the presidency of the Liverpool Medical Institution. A recent example of effective coöperation is afforded by the harmonious working of the city council with the Consular Corps, His Majesty's Customs, the Mersey Docks and Harbour Board, the shipowners, and the neighbouring Merseyside sanitary authorities. Dr. Hope himself is known to be in favour of a more complete unification of the medical public health services. In his retirement, where the warm wishes of all public health workers go with him, it is to be hoped that he will still assist us with [illegible]actical idealism.

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[1] The Registrar-General's Statistical Review of England and Wales for the Year 1923. Tables, Part I., Medical. H.M. Stationery Office. 15s.

[2] THE LANCET, 1924, i [illegible]

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not fixed independently by any university or corporation, but laid down by a representative body under Government ægis. Such conditions, it will be seen, are wholly at variance with the picture of the scholar who, failing any suitable environment or chances, wins his way to a degree; while that is the ideal, and a noble one, of external studentship at the University of London. No medical student can dispense with university or collegiate training, and to provide wider opportunities for graduation is the function of those excellent universities whose recent development in our provinces is tangible proof of the progress of education in the country. We cannot sympathise with any movement, through committees of inquiry or statutory commissions, which would prevent properly trained medical students from obtaining the coveted London degree; but it is not accurate to suggest that these students are the product of home study, or representative in any way of the class of external students of whom the University of London has been such an admirable protector. But the University has charges at home as well as abroad, and the London schools have felt that their students, through lack of intimate association with the University, have been placed at a professional disadvantage. The Haldane Report certainly designed to meet this position.

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THE TISSUE PATHOLOGIST.

DURING the war, in every branch of medicine, circumstances necessitated the employment as experts of men whose chief claims to such positions were their enthusiasm and devotion to duty. Even in the highly organised German medical service the existence of *ersatz* bacteriologists, surgeons, and so forth was openly recognised. And it must be admitted that, on the whole, the work was very well done. But with the return to normal conditions it was once more justly expected of the expert that he should have an expert's training. In the field of clinical pathology, however, a greater tolerance has been exercised, especially where tissue diagnosis is concerned. The impetus given to laboratory medicine in the last few years, as Dr. KENNETH M. LYNCH, of Dallas, Texas, has recently pointed out,[1] has produced a demand for clinical pathologists out of all proportion to the supply of people adequately prepared to undertake this work. Whereas the simpler laboratory procedures can be satisfactorily performed by the beginner after a comparatively short period of training and practice, the more difficult examinations demand a much more prolonged apprenticeship. Especially is this so in the branch of histological diagnosis which, in the view of Dr. LYNCH, is "the most difficult and exacting in the matters of knowledge, experience, and judgment of all the things that the laboratorian is called on to do." The question naturally arises as to what constitutes the necessary minimum of training for the pathological histologist before he can be considered fit to undertake this work.

In order to gather opinions on this point, Dr. LYNCH sent a questionnaire to a number of leading pathologists in all parts of America. The answers received were practically unanimous in demanding a much more stringent standard and a much more arduous training than might have been expected. The general consensus of opinion was that the candidate should be qualified from a reputable medical school, should have had some experience of hospital service, and should have served an apprenticeship from two to three years in a laboratory through which passes abundant material. While such a training may be considered adequate to equip a man for ordinary routine work a further period of from three to five years "under an able leader, in a service with abundant necropsy and surgical diagnostic material. with full opportunity to observe end-results, should qualify a man of personal fitness to do critical anatomic analysis of any and all diseased tissue." A probation of this magnitude may sound unnecessarily formidable to those whose work lies in other directions, but its reasonableness will appeal to the pathologist in proportion to his experience of histology. The reason why there are so few tissue pathologists of this calibre is not far to seek. The prizes in pathological histology are few and meagre; the best men are rarely attracted to it, and to those who are a large practice in routine diagnosis is uncongenial. It frequently happens, therefore, that tissue diagnosis falls into the hands of those who are ill-equipped to undertake it, with untoward results. The remedy rests with the medical profession, especially with the practitioners of surgery who are chiefly concerned. If first-class diagnosis is demanded, it will be forthcoming. The question is essentially an economic one.

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EPIDEMIC PLEURISY.

WE publish to-day a clinical note by Drs. W. ATTLEE, A. M. ANSLER, and D. C. BEAUMONT describing an epidemic which occurred in Eton College in the early summer of this year. Fully 50 patients. boys from 14 to 18 years of age, were affected, whilst sporadic cases of a similar nature were observed in the neighbourhood. The main features of the disease were sore-throat, sometimes in the form of a granular pharyngitis, and sometimes of a follicular tonsillitis, a pyrexia lasting a few days only but tending to relapse, and pleurodynia often associated with a marked pleural friction-sound. With each relapse there was a tendency for a fresh patch of pleurisy to appear, but cough and pneumonic symptoms were conspicuously absent. Convalescence was somewhat protracted, anæmia and debility not infrequently being sufficient to necessitate the granting of sick-leave. Cardiac, renal, or arthritic complications were never observed. A closely similar epidemic was noted in THE LANCET of July 12th of this year, when Dr. BRUCE WILLIAMSON reported an outbreak which had occurred at the country branch of the Paddington Green Children's Hospital. Differences between the clinical manifestations of these two epidemics were so slight that it is reasonable to conclude that the same causal agency was responsible for both, especially in view of the fact that the two institutions involved are situated within a mile of one another.

Descriptions of such epidemics are a perennial reminder of the obscurity which still envelops even the more important infectious diseases. An official paper, circulated to the medical officers of army units in the north of France in the summer of 1918, gave an account of an epidemic disease which had recently appeared and which the writers termed "three-day fever." It was said to be a condition of mild pyrexia of transient course, without complications or sequelæ. Its brief duration and the absence of grave consequences were said to make isolation and serious treatment alike unnecessary. Yet within a month of the circulation of this document the hospitals and graveyards were being choked with the results of this disease, which by then was recognised as pandemic influenza. We do not yet know to what extent this disease was responsible for checking the final desperate offensive of the German armies, but that in many sectors of the field of war it led to it should, as is evident by the legend on the plate itself, be Henry IV. of France. Another interesting point which Prof. Bloch deals with in a learned fashion is the question as to whether kings received any priestly or quasi-priestly quality at their sacring. The upholders of royalty said they did; the upholders of the Papal temporal powers, whom Prof. Bloch calls Gregorians, said they did not. In both England and France the extreme claims of the Papacy were disliked and set at naught as far as might be, witness in France the movement known as Gallicanism and numerous documents quoted by Prof. Bloch, and by Mr. Alison Phillips in a letter on Papal Authority in England, which appeared in the *Times* of July 26th, 1924, in which among other documents he quotes an Act, 10 Henry VII. fol. 18: *Rex est persona mixta cum sacerdote, quia tam ecclesiasticam quam temporalem habet jurisdictionem.* We have not the space to follow Prof. Bloch all through his very careful and richly documented study, his researches into the meaning and history of unction, and into the rivalries between the upholders of the French and English claims respectively to be the only royal houses capable of exercising the rite of healing. Even as late as 1584 Reginald Scott said in his "Discoverie of Witchcraft" concerning healing of the king's evil, "which hath been alwaies thought and to this day is supposed to be a miraculous and peculiar gift, and a speciall grace given to the kings and queens of England." A little further on he maintains in a passage quoted by Prof. Bloch that the cure is not due to any special grace residing in the king. It is interesting to see, however, that the popular taste also trusted to charms, one of which we notice Scott quotes (p. 197, Nicholson's ed., 1886), "Remedies to cure the King's or Queen's Evil is first to touch the place with the hand of one that died an untimely death—Otherwise; Let a virgin fasting laie her hand on the sore and saie: Apollo denieth that the heate of the plague can increase where a naked virgin quencheth it: and spet three time upon it."

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[1] Journal of the American Medical Association, July 12th, 1924.

THE NEW YORK ACADEMY OF MEDICINE.

THE annual report for 1923 of the New York Academy of Medicine records the steps taken in connexion with the offer made by the Carnegie Corporation in 1922 to provide a million dollars for a new building, provided the Academy furnished the site. A site was purchased at the cost of $754,500, but when preliminary plans were studied in accordance with Academy needs, it was found that the building would cost a considerably larger sum than had been originally estimated by either the Board of Trustees or the Carnegie Corporation. Negotiations with the Carnegie Corporation were renewed with the result that the Corporation requested the Academy to make a new study of its needs and endeavour to have plans prepared for a building which would be considerably less expensive than the original plan, which was roughly estimated between $1,750,000 and $2,000,000. The Trustees decided to appoint a director able to give the necessary time to the plans for the present and future activities of the Academy. This situation was placed before the Trustees of the Rockefeller Foundation with the result that the Foundation help in paying the salary of the director and his necessary expenses. Dr. Linsly R. Williams was appointed director and began his work on Jan. 1st, 1924.

The scope of the Academy has grown steadily since it was founded in 1847, primarily for the purpose of providing a reading-room for its members. The reading-room gradually developed into a large library, and at the present time there is a membership of 1450 resident fellows, and some hundreds of non-resident fellows, associates, and honorary fellows. At present the Academy is housed in a five-story building at 17, West 43rd Street, and in this building maintains a library, which is the second largest medical library in America, consisting of 130,000 volumes and 20,000 pamphlets. It is open to the Fellows of the Academy and during the morning to the general public, and is used by 30,000 readers a year. The Fellows of the Academy hold two stated monthly meetings which are devoted to scientific purposes, and a dozen different sections meet on the various specialties in medicine once a month during the winter. There are also several special lectures held during the year. The Academy is also the meeting place of the County Medical Society and of dental societies and medical associations of various types. It also provides office quarters for the Medical Society of the State of New York and a number of physicians' aid associations. There are also special committees appointed—one on the library, one on education, and one on public health. The work of the committee on public health has recently received notice in our columns. The committee on education directs the work of two former societies—the Society for the Advancement of Clinical Study and the Society for the Advancement of Medical Education. This committee maintains a bureau of clinical information which announces daily the list of operations to be performed in the various hospitals of New York City, and also gives information as to the various post-graduate courses which are open to the post-graduate students in this city. This work, which has only recently been organised, seems likely to develop in a way more or less similar to the post-graduate education which is being carried on under the auspices of the Royal Society of Medicine in London.

CONGENITAL MEGACOLON.

IN THE LANCET of August 2nd we drew attention to a case of this disease communicated to the Medical Society of Hospitals of Paris, in which the distended loop was of enormous dimensions. A monograph of 243 pages has just been published by Dr. G. Tonnini,[1] professor of surgery at the hospital in Mondolfo, which, besides a very complete bibliography and report of a case under his own care, contains a tabular analysis of the 62 cases hitherto published by Italian observers such as Mya and Concetti, who strongly supported Hirschsprung's original conception of the congenital nature of the affection, contributing by their researches, especially in the field of histology, to complete the anatomical picture of megacolon and to explain the changes which are peculiar to this disease. If the much-discussed theory of Hirschsprung is at the present day recognised as true for a certain limited number of cases of dilatation of the large intestine, this is due in a large measure to the validity of the arguments brought forward by Italian authors. To prove this is the task Prof. Tonnini, with the coöperation of Profs. Simonini and Schiassi of the University of Modena, has set himself to perform. A reference to the 62 cases published in Italy shows that there was incontrovertible evidence of congenital origin in the sense expressed by Hirschsprung and Mya, from (*a*) previous history and clinical and anatomical data 22 cases, (*b*) history and clinical data 5 cases, (*c*) clinical and anatomical data 14 cases, and (*d*) from anatomical data alone 5 cases. Five cases seemed to support the contention of Marfan, Neter, and others as to the ætiological part played by unusual length, multiple folds of the iliac, sigmoid, and recto-colic kinks. In two cases only was there definite mechanical obstruction, while in nine it was found impossible to assign any causation. This little work may be said to contain all that has been written up to the present time concerning megacolon, and will well repay perusal.

DERMAL MYIASIS AND THE TUMBU-FLY IN SIERRA LEONE.

THE prevalence of myiasis from the Tumbu-fly in Sierra Leone is very considerable, causing much discomfort to man, suffering and even death to domestic animals. The Tumbu-fly, *Cordylobia*

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[1] Megacolon Congenito. Premiata cooperativa tipographi, Modena. 1924. Pp. 243.

THE TREATMENT OF GLAUCOMA.

GLAUCOMA has given rise to more controversy than almost any other subject in the range of ophthalmology. A new treatment is reported by our Berlin correspondent, who refers to a paper read by Dr. Carl Hamburger before the Berlin Medical Society, advocating the subconjunctival injection of suprarenin. The effect produced, he says, is an enlargement of the pupil and decrease of pressure, while the choroidea becomes anæmic through blocking of the small arteries. The amount injected at one time is ½ c.cm., and the dose has to be repeated as soon as the symptoms recur. By this method he claims to have treated several patients with success. A method of counteracting increased intra-ocular tension by diminishing the quantity of blood entering the eye runs counter to all that has hitherto been taught on the subject. The dilatation of the pupil in itself is a contra-indication, and to cause retinal anæmia would hardly seem to be the best way to combat a disease in which retinal function is gravely impaired. Moreover, any good effect of a drug like suprarenin is bound to be only temporary. The aim of all rational treatment has hitherto been not to prevent the entry of fluid into the eye, but to facilitate its exit. In the normal eye the main channel of exit is Schlemm's canal, to which access is given through the trabecular tissue that occupies the angle of the anterior chamber. When this is made shallow by pressure from behind, due to increased intra-ocular tension, access is difficult, and when the pupil is dilated the angle is made still smaller and the difficulty increased. Hence, the traditional treatment of glaucoma—non-operative by eserin, which contracts the pupil, and operative by iridectomy, which provides an artificial anterior chamber. Often, however, these measures are insufficient, and the modern operations—Elliot's, Lagrange's, Herbert's—aim at providing an alternative exit for the intra-ocular fluid through the sclera. If there is one lesson which modern experience with regard to the treatment of glaucoma has taught, it is the danger of temporising too long. We should therefore hesitate to encourage the trial of any new experimental treatment without convincing reasons in its favour.

UNCENSORED SUGGESTIONS.

IN a scientific service with good discipline there is always the risk that improvements suggested by junior officers will not become known. The administrative officers, the seniors, arrange the work which is carried out by the executive officers, the juniors, whose daily work it is that will be most affected by the new procedures. But it is conceivably possible that even junior officers may have a few useful ideas even if not all of the highest value ("We are none of us infallible, not even the youngest of us"), which at any rate the seniors ought for their own sakes to hear about. We observe that the Medical Corps of the U.S. Navy, in its *Bulletin*, provides just such an outlet for its junior officers by publishing monthly suggestions from them, without any official comment whatsoever. Thus the service becomes aware of the ideas that are working within it long before these have secured official approval. Some day, and no one can tell when, some very valuable thought may emerge. Perkin, we are told, made his first aniline dye at the age of 18, and Pasteur, when he was 20, recognised that there were two kinds of tartaric acid crystals. In a recent (May) number of the *Bulletin* a junior medical officer, anxious to prevent the spread of infectious diseases in ships, states as his opinion that the most effective method would be to search out all cases where infectious disease might be incubating, before definite diagnosis is possible, rather than to carry out a scrupulous and minute disinfection of messes and bedding after the disease has become manifest, and has probably infected others. He calls this subsequent disinfection "bunkum," an expression which seems to suggest disapproval, and he adds that his captains are "astounded" when they find that terminal disinfection is not to be practised in their ships. Nothing will prove the correctness of this particular suggestion better than a statistical investigation, the result of which we hope to find in the *Bulletin* hereafter, for the question is of importance.

THE HEALING POWER OF KINGS.

A WORK of extraordinary erudition and one which has evidently entailed upon its author a vast amount of research has recently been published[1] by Prof. Marc Bloch. As in the case of so many ancient religious customs, the inquiry into the particular subject in hand involves an investigation into many ancillary customs, in this instance the divine right of kings: the quasi-sacerdotal privileges conferred upon sovereigns at their sacring by the holy oil with which they are anointed and by the priestly vestments with which they are clothed; various folk-lore beliefs, such as the curious gifts with which "seventh sons" are dowered and many others. All these matters Prof. Bloch has treated at length, and the result is a volume of great interest. His main theme was handled some years ago in a book entitled "The King's Evil,"[2] by Dr. R. Payne Crawfurd, to whom Prof. Bloch expresses his obligations more than once. We might compare the relation of the two books to the commentary of Servius upon Virgil, for Prof. Bloch may be said to comment upon and illustrate the facts and researches of Dr. Crawfurd in a way which, without at all minimising that admirable work, yet throws an additional flood of light upon a difficult subject, in much the same way as the commentary of Servius lights up, to take one instance, the sixth book of the Aeneid. Prof. Bloch begins by telling a delightful story. In 1340 Brother Francis, a Dominican, Bishop of Bisaccia, chaplain of King Robert of Anjou and for the moment ambassador of Edward III. of England, paid a diplomatic visit to the Doge of Venice with a view to negotiating an alliance, for the struggle known in after years as "the hundred years war" had just begun, although diplomatic efforts had not ceased. The ambassador pointed out that "the most serene Prince Edward, desirous of avoiding a slaughter of innocent Christians, had written to Philip of Valois, who calls himself King of France, proposing that he (Edward) and the French king should decide the point at issue without going to war, by a personal duel, by a combat between six to eight champions representing either side, or by one of the two following trials. If the King of France were as he said the true king, let him expose himself to some hungry lions, for lions it is known will never hurt a real king, or else that he should show himself a real king by healing the sick, which it is well known real kings can always do." But, adds the Bishop, "Philip in his pride rejected these proposals." Such is the text upon which Prof. Bloch founds his learned essay. He discusses at great length the origin of the healing touch in France and repudiates the tradition that it originated with Clovis; he considers that Robert the Pious, the second king of the House of Capet, was the first to exercise the healing powers for other diseases as well as for scrofula. By the time of Philip I., his grandson, the healing was limited to scrofula alone. In the same way as regards England, he considers that the healing of scrofula began with Henry II. or possibly with Henry I., but that neither Edward the Confessor nor any other Anglo-Saxon king pretended to any healing powers as king. Edward, it is true, is traditionally reported to have healed the sick, but as a saint, not in virtue of his kingship. Incidentally, the plate opposite p. 344 is wrongly described as Charles II. touching for the evil:

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[1] Les Rois Thaumaturges: Etude sur le caractère surnaturel attribué à la puissance royale particulièrement en France et en Angleterre. Par Marc Bloch, Professeur à l'Université de Strasbourg. Great Britain: Humphrey Milford, Oxford University Press; Strasbourg et Paris: Librairie Istra. 1924. Pp. 542. Fr.30—12*s.* 6*d.*

[2] THE LANCET, 1911, ii., 1012.

it should, as is evident by the legend on the plate itself, be Henry IV. of France. Another interesting point which Prof. Bloch deals with in a learned fashion is the question as to whether kings received any priestly or quasi-priestly quality at their sacring. The upholders of royalty said they did; the upholders of the Papal temporal powers, whom Prof. Bloch calls Gregorians, said they did not. In both England and France the extreme claims of the Papacy were disliked and set at naught as far as might be, witness in France the movement known as Gallicanism and numerous documents quoted by Prof. Bloch, and by Mr. Alison Phillips in a letter on Papal Authority in England, which appeared in the *Times* of July 26th, 1924, in which among other documents he quotes an Act, 10 Henry VII. fol. 18: *Rex est persona mixta cum sacerdote, quia tam ecclesiasticam quam temporalem habet jurisdictionem.* We have not the space to follow Prof. Bloch all through his very careful and richly documented study, his researches into the meaning and history of unction, and into the rivalries between the upholders of the French and English claims respectively to be the only royal houses capable of exercising the rite of healing. Even as late as 1584 Reginald Scott said in his "Discoverie of Witchcraft" concerning healing of the king's evil, "which hath been alwaies thought and to this day is supposed to be a miraculous and peculiar gift, and a speciall grace given to the kings and queens of England." A little further on he maintains in a passage quoted by Prof. Bloch that the cure is not due to any special grace residing in the king. It is interesting to see, however, that the popular taste also trusted to charms, one of which we notice Scott quotes (p. 197, Nicholson's ed., 1886), "Remedies to cure the King's or Queen's Evil is first to touch the place with the hand of one that died an untimely death—Otherwise; Let a virgin fasting laie her hand on the sore and saie; Apollo denieth that the heate of the plague can increase where a naked virgin quencheth it: and spet three time upon it."

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anthropophaga, has been indicted as the cause of painful boils for the last 60 years, when the disease was first investigated in Senegal, and the life-history and habits of this mysterious fly and its flesh-eating maggot have recently been worked out by B. Blacklock and M. C. Thompson at the Sir Alfred Jones Research Laboratory in Sierra Leone.[1] The *C. anthropophaga* in the adult stage averages about 9½ mm. in length, and is straw-coloured, with darker wings. The male can be distinguished by the approximation of its eyes. In habitat it is widely, though irregularly, distributed in West Africa from Senegal and Lake Chad to the Cape south of latitude 16° north. In Freetown the adult fly can be captured indoors during the dry season from November to April, and when disturbed it flies rapidly, emitting a loud buzzing noise. The bionomics of the insect, hitherto very uncertain, are described by the authors. The female fly deposits the ova by preference in sand, the number of eggs deposited varying from 200 to 300, while the life-span of the adult insect appears to be about 18 days. The larva, when newly hatched, is just visible to the naked eye and presents several interesting adaptive structures, such as a cephalo-pharyngeal skeleton and several cuticular spines which assist in penetrating the unbroken skin of the host. At this stage the larva remains just below the surface of the sand, but on being disturbed emerges, and when it has reached the skin of its disturber quickly crawls to the nearest wrinkle and commences to bore its way in. The larva undergoes three stages of moulting, and precise experiments indicate that in the second and third stages it is unable to penetrate the tissues to the same degree as the newly-hatched maggot. Further, when the larva in the second or third stage is removed from its cavity in the skin, it is not always able to regain its original position. Prior to pupation the mature larva leaves the tissues of its host and, falling into sand, rapidly burrows into it. The puparium, 6·5–11·5 mm. in length, has a characteristic shape. Pupation lasts about ten days, and on emergence the adult fly has undergone four ecdyses, of which the last occurs inside the puparium. The animals most frequently affected in nature are rats, in the burrows of which puparia are commonly found; other animals, such as dogs, cats, and squirrels, are liable to be attacked. As regards man, some interesting observations are recorded suggesting that after a primary myiasis a considerable degree of immunity to subsequent infection may be developed. The best form of treatment appears to consist in spreading a film of liquid paraffin over the opening made by the larva in the skin, after removing the scab. The posterior end of the larva immediately begins to emerge, and the film is then thickened by the addition of more paraffin. Pressure exerted on both sides of the cavity will then expel the parasite. It is interesting to note that the uneducated natives of Senegal have long been able to distinguish the life-history of the Tumbu-fly from that of the Congo floor-maggot (*Auchmeromyia luteola*). These two flies are very similar to each other in appearance, but the natives are aware that in the former case the larvæ live in the tissues of the host and produce boils, whilst the latter, living in the ground and emerging at night, merely feed on the blood of their victim.

WELFARE OF THE BLIND.

A Bill which will come before Parliament after the recess proposes to give a pension to every blind person at 30 years of age, to provide him with a minimum wage, and to ask the State to make a grant in aid of the continuity of his employment. Already the Blind Persons Act, which the proposed Bill is to amend, has reduced the pensionable age for blind persons to 50, and has subsidised schemes of training for industrial employment. Opinions among the blind themselves differ as to the wisdom of these measures. An organisation known as the National League of the Blind, waiting on the Minister of Health on July 31st, urged him to accept the amending Bill and pressed for the abolition of the voluntary system on which the provision of training facilities is at present largely dependent. On the other hand, the National Union of the Professional and Industrial Blind, through another deputation received by the Minister of Health in the same week, strongly objected to the amending Bill. To reduce the age for pensions from 50 to 30, it was stated, would place difficulties in the way of a really effective training being given. Since the productive capacity of the average blind worker was not more than 50 per cent. of that of the normal artisan engaged in the same occupations, the fear was expressed that the new proposals would increase the reluctance of local authorities to speed up methods of training, with the result that the number of employable blind persons would be actually decreased. The blind themselves considered, it was said, that far better results could be got out of the present machinery. The case is one for the legislature to consider carefully from all sides. The spirit of independence which we associate with the blind workers trained at St. Dunstan's is an asset to the community not to be lightly put in jeopardy. Blindness is not the only disability for which the sympathy of the public is called for, and if special privileges for one class of the partially disabled are provided, it is likely that complaints will be heard from other quarters. Moreover, the line to be drawn between the blind and the not-blind is no hard-and-fast one. "Too blind to carry on his ordinary employment" may be a good enough definition for the purpose of a certificate, but certainly not to confer a definite legal status. Nevertheless, for purposes of legal privilege it is necessary to draw the line somewhere; and if a man of 30, whose sight is no better than finger-counting at 20 inches, is to claim a pension, another who can count up to 30 inches may feel aggrieved if nothing is done for him. The difficulty does not loom nearly so large when pensions are not given until the age of 50 as it would if the age were reduced to 30. We agree with the National Union in doubting whether the Bill to amend the Blind Persons Act would amend the lot of the blind.

HOUSEWIFERY IN A HOSPITAL MILIEU.

An unusual enterprise on the part of a voluntary hospital is announced by Lord Hambleden—the institution under the auspices of King's College Hospital and in its grounds of a school where young girls may receive a ten weeks' course of instruction in the domestic arts and in elementary nursing. The curriculum outlined appears well adapted for its purpose of providing a term of practical instruction in housewifery to follow school life. During the first seven weeks pupils will be instructed in all branches of the work of running the house of residence which they are to share with the pupil nurses undergoing preliminary training. They will also have lessons in cookery, including food values; elementary anatomy and physiology; hygiene, including elementary chemistry of common things; elementary and minor medicine and surgery; the application and making of bandages and surgical dressings; and elementary nursing. For the final three weeks the pupils will be permitted—apparently as a privilege—to take some practical part in the work of the hospital, in the kitchens, housekeeping departments, and the out-patient or casualty departments, but will not be allowed in the wards. The terms for the ten weeks' course will be thirty guineas, inclusive of board residence. It is not clear with what exact object King's College Hospital has decided to enter into competition with the various existing schools of domestic economy where short courses of training on broadly similar lines are given. It may well be that the institution is designed to be a source of pecuniary profit to the hospital, since, besides paying fees, the pupils will be taking the place of paid domestic help in the pupil nurses' home. There would seem to be no danger of the pupils being exploited indirectly for the benefit of the hospital, since only three weeks' participation in its work are to be allowed. Lord Hambleden states that "the intention is to provide a practical course which will be useful to a girl who may have no thought whatever of becoming a nurse, but desires to gain some useful knowledge and, perhaps, to appreciate some of the joy of service." The first of these inducements is more likely to attract girls now leaving secondary or public schools than the second, since the imagination of the modern girl is unlikely to be touched by the glamour which formerly surrounded hospital life. The course should, however, prove attractive on its merits. Instruction as to how to achieve and maintain the high standard of household cleanliness current in our great hospitals will be welcomed, and, moreover, the teaching on subjects ancillary to medicine is likely to be of more practical use than the corresponding courses at the majority of domestic economy schools. The proposed social intercourse between the pupils and the nurses engaged in the hospital work should lead to a useful interchange of ideas between those paying in money for a brief course of instruction and those paying in prolonged service for a complete training. Girls whose direct activities in the hospital are arbitrarily limited to three weeks' sporadic work in the kitchen or out-patient department may envy those who have free access to the mysterious fascinations of the wards, and in this way recruits to the nursing staff may be obtained. It is also possible that critical young eyes may detect and protest against those defects in our system of training nurses which the Rockefeller Commission set out so clearly. But we are assuming an intimacy of association between nurses already in hospital and pupil housewives which the common tennis-courts and dining-room described by Lord Hambleden will hardly ensure, and it is more probable that the two communities will not, in the American phrase, prove good mixers. We shall watch the development of this new school with much interest.

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[1] A Study of the Tumbu-fly (*Cordylobia anthropophaga*), Grünberg. Sierra Leone. By B. Blacklock, M.D., and M. C. Thompson. Annals of Tropical Medicine and Parasitology. Vol. xvii., No. 4, Dec. 21st, 1923.

SCHOOL CLOSURE FOR INFECTIOUS DISEASE.

THE Board of Education has issued a circular to local authorities proposing to amend the Elementary Education Provisional Code, 1922. The lines on which the alterations are to be made are indicated in the circular, where it is announced that the whole matter will be further discussed and explained in detail in a revised memorandum on closure of schools and exclusion from school, to be drawn up under the joint auspices of the Board of Education and the Minister of Health. The main point of alteration evidently deals with the question of school closure. The Board of Education has now come to the conclusion that the best means of preventing a spread of infection during an epidemic is not the closure of whole schools or departments, but the careful consideration of individual children. Such closure is, the circular states, rarely justified on the grounds of health, while on educational grounds it is obviously desirable that schools should remain open. We have in these columns long advocated the watching of individual cases rather than the blind policy of school closure, and now that school closure as a means of preventing financial loss is no longer to be authorised, urban schools throughout the country should become, as they have been in London for the last 15 years, the centre for scientific control of infectious disease. Rural districts with a scattered population present quite a different problem. Control of infection here more often than not is got by prompt closure and notification, and it is to be hoped that special consideration on helpful lines will be given to this point in the revised edition of the code. The circular is welcome evidence that at the Board of Education questions of hygiene receive sound contemplation.

FUR DERMATITIS.

DURING the latter part of the winter 1922–23 a number of women and girls attended hospitals on account of a local irritation around the neck which soon went on to a blotchy erythema and in neglected cases to a condition of chronic eczema. Hundreds of such cases were reported, none of them fatal. Dr. J. H. Sequeira was the first to associate the condition with the wearing of a kind of rabbit skin dyed to resemble beaver, and careful investigation conducted by Prof. A. G. Perkin identified the irritating substance as paraphenylene-diamine or the closely related metaphenylene-diamine. The dyes used were of foreign origin, careless technique having omitted to render the dyed article innocuous by subsequent oxidation. Dr. J. W. Eyre failed to find any pathogenic microbes which could be associated with the causation of the dermatitis. The report[1] by Dr. Allan C. Parsons, just issued by the Ministry of Health, gives an admirable summary of the history of this dermatitis and the stages by which its origin, its distribution, and its causation were worked out to a final conclusion. Two factors determined the incidence, for since only a relatively small number of fur-wearing individuals were affected it was evident that personal susceptibility played a part, and this susceptibility proved to be specific for a certain class of fur. While symptoms sometimes appeared a few hours after contact, in most cases there was a definite latent interval of 2–6 weeks or more between the wearing of the fur and the first signs of reaction. It is satisfactory to be assured, on the authority of the London Fur Trade Association, that the epidemic was exclusively due to foreign dyes and that makers at home had no responsibility for its production. The publication of the report will no doubt ensure the non-recurrence of an avoidable disease.

IN response to the appeal of the Cambridge University authorities for the sum of £33,000 to complete the endowment of a School of Pathology, Mr. Ernest Gates, of Milner Field, Bingley, Yorks, has promised to provide the required amount. The trustees of the Rockefeller Foundation recently offered to provide the University of Cambridge with £100,000 to build a School of Pathology, together with the sum of £33,000 towards its endowment, on condition that the University could obtain a further £33,000 for this purpose. Mr. Gates's generous gift now makes the acceptance of the Rockefeller offer possible.

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[1] Reports on Public Health and Medical Subjects. No. 27. H.M. Stationery Office. 1924. 9*d.*

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

STRASBOURG FACULTY OF MEDICINE.—A complete practical course of dermatology and venereology will be held at the Clinic of Syphilitic and Skin Diseases in Strasbourg, from Sept. 22nd to Nov. 8th, under the direction of Prof. Pautrier. The course will consist of 57 lectures in dermatology and 42 lectures in venereology, accompanied by a demonstration of patients and lantern-slides. In connexion with the skin clinic there is a library of 3000 volumes, which will be available to those attending the courses. The enrolment fee is 200 francs. Fuller particulars may be obtained from Prof. Pautrier at the Medical Faculty of Strasbourg.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXVI.—TREATMENT OF ESTABLISHED TABES.

No account, however brief, of the treatment of tabes would be adequate without its preface. Within the central nervous system nerve fibres, once their continuity is interrupted by disease, are incapable of regeneration. Though it may be possible by suitable treatment to prevent further extension some irreparable damage will remain. Hence the overwhelming importance of *early* diagnosis. The diagnosis being made, treatment may be considered under the headings General Régime, Anti-Syphilitic Treatment, and Symptomatic Treatment.

General Régime.

The general principle is to be inculcated that the damaged machinery should not be overloaded. Exertion, mental or physical, should never be pushed beyond the point of fatigue. Since in addition to those nerve fibres which have been already destroyed by the disease there are others whose function is barely maintained and whose continuity, as it were, hangs on a thread, substances which are known to have a deleterious action upon the nervous system should be used with strict moderation. Of these the most important are alcohol and tobacco. Exposure to cold and wet, even if it has no influence upon the course of the disease, may certainly provoke an exacerbation of lightning pains, and is therefore to be avoided. Finally a special caution must be given against excessive sexual indulgence, which, in the experience of most clinicians, has at times been immediately followed by signs of increased damage to the cord.

Anti-Syphilitic Treatment.

Tabes is a late result of a generalised infection by the *Spirochæta pallida*, which has been demonstrated post mortem in the spinal cord and posterior nerve roots of cases of the disease. The symptoms of the illness are due to irritation and destruction of nerve fibres; the progress of the disease is caused by the continued action of the spirochætal poison. Adequate treatment by means of spirochæticidal drugs may fairly be expected to arrest this progress. The tried remedies of this nature at our disposal are arsenic, mercury, and potassium iodide. Of these there is no doubt that arsenic is the most effective; the value of mercury is more doubtful. The late Sir William Gowers expressed the opinion that in cases of tabes energetic mercurial treatment such as was given at one time at Aix-la-Chapelle only did harm. Potassium iodide certainly has not the same favourable influence upon the course of tabes as it has upon meningeal and vascular syphilis. Nevertheless, since both mercury and potassium iodide appear to be effective in syphilis elsewhere in the body, and we are dealing with a generalised syphilitic infection, both these drugs may be given concurrently with arsenic, provided that the doses employed do not upset the patient in such a way as to interfere with the administration of full doses of the more important drug. In this as in other matters the tolerance of the individual patient must be studied. I have met with cases in which the combined course of treatment resulted in malaise and anorexia: yet when the mercury and iodides were withdrawn the patient tolerated full doses of arsenic without discomfort.

Of the three methods of injecting arsenic—intravenous, intra-muscular, and subcutaneous—the intravenous route is to be preferred on practical as well as upon theoretical grounds, provided that the patient has veins suited to the purpose. The practical advantage of this method is its freedom from all pain save the immediate prick of the puncture. In theory it provides the most effective means of submitting the causal organisms of the disease to the immediate influence of maximal doses of the drug. Clinical experience supports this hypothesis, for in cases which eventually show good results from treatment, the first intravenous injections are commonly followed within 24 hours by an exacerbation of symptoms, such as lightning pains or visceral crises, probably indicating a focal reaction to the treatment. The fact that intravenous injections are more liable to produce symptoms of an immediate "toxic" reaction in the patient than subcutaneous or intramuscular doses is no objection to their use. Animal experiments have shown that the germicidal action of arsenobenzol compounds upon an infecting protozoon is roughly proportional to their toxic action upon the host, so that within the limits of safety[1] "toxic reaction" in the patient may be taken as evidence of efficient dosage.

Of the various preparations of arsenic suitable for intravenous injection that known as novarsenobillon best combines simplicity and efficacy, being readily soluble and easy to administer. A dose of 0·9 g. N.A.B. in 10 c.cm. of distilled water gives a perfectly clear solution. Experience has shown that certain unpleasant symptoms such as headache, fever, and shivering which occasionally follow within 24 hours of an injection may be due to the presence of dead bacteria in the water used for the solution. It is therefore advisable to use for this purpose ampoules of distilled water which has been sterilised and sealed immediately after distillation. Such ampoules, containing 10 or 20 c.cm., are easily obtainable. The technique of intravenous therapy lies beyond the scope of this article, but in view of the fear of a "bad arm" after injection, which is sometimes a bar to efficient treatment, two points may be noted. First, the vein to be easily pierced must be adequately compressed, and this is most simply done by applying the pneumatic band of an ordinary sphygmomanometer and blowing it up to a point just insufficient to obliterate the arterial pulse. In the second place the least sign of leakage into the tissues at the commencement of injection should be the signal for withdrawal of the needle and puncture of another vein. Upon the question of dosage no hard-and-fast rules can be laid down. Individual symptoms and individual tolerance have to be considered in each case. The following plan is suitable in the case of a male adult who tolerates the treatment well.

A mixture containing ʒi of the liquor hydrarg. perchlor. and 30 gr. of pot. iod. is given three times daily from the onset. The course of arsenical treatment begins with an injection of 0·45 g.; after a week's interval 0·6 g. is given, and subsequently doses of 0·9 g. at weekly intervals until approximately 5 g. have been given. An interval of six weeks is then allowed during which the mixture is continued, but no arsenic is given. In practice this has been found a safe period to allow for the prevention of cumulative arsenical poisoning. The injections of 0·9 g. are then continued at weekly intervals until a further 5 g. have been given. At the end of this course the patient is allowed six weeks' freedom from all drugs; the mixture and injections are then begun again until a further 5 g. of N.A.B. have been administered, and the patient continues with the mixture for a further six weeks.

Further treatment will depend upon the state of the disease. In the great majority of cases progress will have been arrested, and symptoms in some degree relieved; in this case the patient may be released with the advice to attend for further treatment if fresh symptoms develop, and *in any case* to attend annually for a short course as a preventive of further trouble. This course should consist of four weekly doses of 0·9 g. N.A.B. together with mercury and iodide by the mouth as before.

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[1] Safe preparations are those which bear a label stating "The contents of this box have passed the tests of the Medical Research Council for toxicity and therapeutic activity."

The results of anti-syphilitic treatment carried out upon these lines are encouraging. In the majority of cases the progress of the disease is brought to a standstill; the severity of lightning pains and visceral crises also is frequently mitigated. Some few cases, however, in spite of treatment progress from bad to worse, so that no absolute assurance of relief can be given to a patient. In these cases anti-syphilitic treatment should be continued so long as the patient develops no symptoms of intolerance. Most tabetics bear well the dosage of N.A.B. described. A careful watch must be kept for individuals intolerant of arsenic; for since the poison has a cumulative effect, severe toxic symptoms may continue to develop for several weeks after the last injection has been given.

The W.R. in blood and spinal fluid is often valuable in confirming a diagnosis of early tabes. As a guide to progress and further treatment it is unreliable, since it is by no means rare to discover actively progressing tabes with a positive history of syphilitic infection despite a negative reaction in both blood and fluid. As to the intrathecal injection of salvarsanised serum, the theoretical basis for its use is insecure, it is a complicated, costly, and painful procedure, and there is no certain evidence to show that the clinical results achieved by it are better than those which may be expected from intravenous injections alone.

Symptomatic Treatment.

The severity of lightning pains may be mitigated by means of the coal tar analgesics. Veramon in doses of 6 to 12 gr. is especially useful. Opium should be reserved for rare occasions, as when it may be essential for a special purpose that the patient should obtain complete relief for a few hours.

Gastric crises, if the patient is capable of taking drugs by the mouth, may be partially relieved by the administration of chloretone in 10 gr. cachets (two or three in 24 hours) or an attempt be made to abort the attack by a single dose of 20 gr. Tr. belladonnæ in 10 ♏ doses also has a favourable effect in some cases. Failing these remedies morphia judiciously administered by a nurse at critical periods affords the only measure of relief. In a prolonged attack, warmth, rest in bed, and rectal glucose are essential to combat the prostration. In long-standing cases recourse may be had to operation. Posterior root section is seldom of permanent value; more favourable results have followed section of the pain tracts in the spinal cord, a more delicate but less severe operation than the other.

Bladder disturbances may be of two kinds. Spasmodic evacuation with imperfect control may be relieved by tr. belladonnæ in 5 ♏ doses thrice daily. Atony of the bladder wall with retention may be combated with a similar dose of liq. strychninæ. In either condition the patient should be instructed to attempt to pass water at regular (three hourly) intervals regardless of desire. Retention with overflow calls for regular catheterisation and a daily wash out with 1/2 per cent. acetic acid. The ataxia may be partially compensated by means of the exercises originally suggested by Frenkel. These may be commenced in bed, and with their aid it is sometimes possible to obtain some power of locomotion even for patients long bedridden.

Perforating ulcers are more easily prevented than cured. The tabetic should be warned never to cut his corns. Charcot's joints in the acute stage should be treated by rest and immobilisation. In the later stages celluloid splints may be of great value in preventing excessive mobility (especially at the knee-joint) without overburdening the limb.

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BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 398.)

SECTION OF PATHOLOGY AND BACTERIOLOGY.

WEDNESDAY, JULY 23RD.

AT the opening session, the President of the section, Prof. CARL BROWNING, being in the chair, Dr. ALEXIS CARREL (United States) read a paper on

Tissue Culture.

Dr. Carrel said that his interest in the healing of wounds and the rate of cicatrisation had led him to take up tissue culture as a means of approaching the elementary principles of the problem. The earlier work of Ross Harrison was important as being that of a pioneer, but the technique was rudimentary and the cultures impure. More recently methods had been devised which enabled pure strains of certain tissues to be obtained and to be cultured indefinitely. When this had been achieved it was possible to proceed to the study of the rate of growth and the exact measurement of various factors influencing growth. Pure cultures could be obtained by one of two methods. The first consisted in taking advantage of the greater rate of proliferation of certain tissues—e.g., fibroblasts—which in the course of time outgrew other tissues with which they might in the first instance be admixed. In like manner in a mixture of blood-cells the ultimate survivors were the large mononuclear cells which outgrew the other elements whose vitality was of a much lower order. The second method depended upon the selective action of certain media; thus leucocytes of the large mononuclear type grew well in serum, but poorly in embryonic tissue juices, whilst the converse held for fibroblasts. Once pure cultures had been obtained the labour of keeping them growing was very great since it necessitated frequent subculture, preceded by washing the fragment used in Tyrode's solution. An alternative method had been devised which was of great use in this connexion and consisted in embedding the fragment of tissue under cultivation in some solid retaining medium placed in the bottom of a small glass capsule, with the nutrient fluid floating above it; with such an arrangement the fluid culture medium can be changed every two to three days and the tissue may remain growing and undisturbed for from 15 days to a month. Utilising technique of the variety described Dr. Carrel had maintained chicken fibroblasts for as long as 12 years in active culture, a period which is in excess of the normal life of the animal from which the tissue had been derived. Preparations were exhibited of large mononuclear cells, squamous epithelium, and thyroid epithelium, all of which had been successfully cultivated.

Dr. Carrel had directed his attention particularly to the rate of growth of various tissues and the factors influencing this, and described the method adopted for estimating it. Tissues were endowed with a certain residual growth energy which enabled them to proliferate and live for some time after removal from the body if placed in a neutral medium. This was not true growth, but depended upon factors carried from the parent body into the medium which after a time became exhausted; this feature was more noticeable in embryonic than in maturer tissues. In like fashion the growth-stimulating substances present in the tissues, serum, and body juices were more active in young animals than in older, and the same factor, controlling tissue growth, seemed implicated in the processes of cicatrisation in the body.

Up to the present time Dr. Carrel and his staff had been largely occupied in overcoming technical difficulties and ascertaining what conditions would give the best results. Their investigations of the large field which these methods opened up was only now beginning. Certain principles had begun to emerge from a mass of experimental data amongst which he would mention that it had been established that the growth energy of cells in vitro was mainly a function of the medium used. Given a suitable medium the fibroblasts of the chick could be grown indefinitely and were immortal. Serum was not a generally suitable medium, but a selective one; it inhibited the multiplication of fibroblasts and epithelium, but not of large mononuclear phagocytes. Plasma alone was not a nutritive medium; certain additional factors, present in embryonic juices, were necessary to promote growth, and in the earlier work of Ross Harrison and others true growth was not present, only survival of the tissue implanted. It had been possible to demonstrate the secretion of cells upon a small scale, notably with leucocytes and the thyroid epithelium. The promise of this method of attacking the problems of biology and pathology was enormous, and at the present time the way was open for the examination of numerous problems; the difficulties, which must not be misunderstood, were mainly those of technique. What was wanted were improvements which would enable tissue cultivation to be carried on not only with the ease with which bacterial cultivation is carried on, but upon a large instead of a microscopic scale. Dr. Carrel was full of hope that these difficulties would be surmounted. At present the number of workers in this field was small, but he hoped that others would take it up, and he looked forward to new ideas and extended results which would follow when more workers brought their interest to bear upon the problems he had discussed.

Dr. S. **RICART** (Barcelona), who had learned the technique of tissue culture from Dr. Carrel, referred to the importance of the work of the American biologists in this field. He had studied tissue culture and found the difficulties present to be entirely those of technique; once this was simplified the difficulties would be mastered. The life of cultivated tissues was precarious in proportion to the specialisation of the tissues; fibroblasts alone could be cultivated indefinitely. The growth in any case varied with the composition of the medium and was not controlled by other factors. Cells which did not survive underwent fatty degeneration and disintegration. The method had been applied by him to the examination of antiseptics and the comparison of their antiseptic effect with their deleterious action upon the tissues.

The **PRESIDENT** commented upon the fibroblast-like appearance of the macrophages in some of Dr. Carrel's preparations. With him it had been an article of faith that under certain conditions fibrous tissue cells might become undifferentiated so as to resemble mononuclear cells, but the possibility of the converse taking place had hardly been accepted. The disappearance of polymorphs from a culture of blood elements was comprehensible as the polymorph was the finished product of a definite life-cycle, but it would be interesting to know what would be the fate of its precursors—e.g., myelocytes—in like circumstances. With regard to the increase in amount of growth, he suggested that increase in weight would be the best criterion, if that could be measured.

Mr. C. J. **BOND** asked how the pH of the media used was determined and how it was regulated.

Dr. J. H. **DIBLE** said that the speaker had mentioned the necessity of certain substances derived especially from embryonic tissues as stimulating and essential factors for the growth of culture. He asked if anything was known of the biological properties of these substances; were they heat-stable, could they be preserved, or were they labile substances like complement?

Dr. T. G. M. **HINE** and others asked for details of the composition of Dr. Carrel's media. As made up from published formulæ it was not always satisfactory and sometimes acid, requiring added alkali to reduce its reaction. Dr. Hine had used oxalated plasma and thought it had an antiseptic effect.

Prof. M. J. **STEWART** said that as one unfamiliar with the technique he was greatly impressed by its possibilities in bearing upon a number of pathological problems. He would like to ask what was the relative phagocytic activity of fibroblasts and macrophages in vitro; also if neuroglia was possessed of any powers of growth and phagocytosis, especially as it possessed the latter faculty to a marked degree in some brain degenerations. He further asked for information as to the behaviour of fibroblasts and epithelium when grown side by side.

Dr. J. E. **MCCARTNEY** said that he had seen Dr. Carrel working in the Rockefeller Institute and was greatly impressed by the technical difficulties in carrying out this work. He mentioned that success or failure might depend upon the quality of the glassware used, and suggested that the method might be of use in the study of filtrable viruses.

Dr. J. **CRUICKSHANK** spoke of the results which had been achieved by Dr. A. H. Drew, and mentioned that he was carrying out tissue cultures by the same technique. It was exceedingly important to use pure chemicals. Rat and mouse tumours grew well, and kidney tissue perhaps best of all. He had been impressed by the fact that to grow the fragments of tissue had to be supported in some way, floating fragments showed no growth. He did not quite appreciate the distinction made by Dr. Carrel between growth and survival. If mitotic figures and cellular increase were observed, did not that constitute growth?

Reply.

Dr. **CARREL**, replying at some length, said that he had never succeeded in cultivating polymorph leucocytes; in cultures made from mixed blood elements they always underwent phagocytosis by the mononuclears. The change of the mononuclear to a fibroblast-like form was not a usual one, but only occurred under special circumstances connected with stresses occurring in the coagulated plasma in the medium. He did not know if it was possible to produce a variety which perpetuated this morphology in culture. Replying to Mr. Bond, the H·ion concentration of the medium had to be between 7·4 and 7·8 on the pH scale. Colorimetric methods were used for its estimation, and the condition of all media was tested daily prior to their use.

The nature of the growth-stimulating substance derived from fœtal tissues had been the subject of much inquiry, and its exact nature was still unknown. They had learned, however, that it is an unstable substance, disappearing in a few days at 37° C. and more rapidly at higher temperatures. It is precipitated from solution by protein precipitants and appears to be a nucleo-protein, but cannot be replaced by any known substance of this nature. With regard to the media, a great variety may be used, plasma being the one best suited for stock cultures. The chemicals used must be absolutely pure and the distilled water above suspicion. The refractive index and pH of all solutions was estimated daily in his laboratory prior to their being used. In answer to other questions, he stated that phagocytosis by fibroblasts was very slight, but that shown by mononuclear leucocytes was marked. The cultivation of neuroglia had not been undertaken. With regard to his definition of growth, the presence of mitotic figures and cell multiplication did not mean growth in his sense; there was enough nutritive substance existing in a newly planted fragment of tissue to allow this, and the tissue might live and, in the case of heart muscle, pulsate for a long period and yet show no actual growth, as the fragment gradually underwent progressive diminution. By growth he meant the fabrication of new cells wholely and solely from the constituents of the culture-medium, and increase in the mass of the culture. Weighing the tissue was the ideal way of determining this, but at the present stage it was a technical impossibility.

Mr. A. **MALINS SMITH** read a paper upon the occurrence of

Protozoal Infections of the Bowel

in inhabitants of this country. He had found *Entamœba histolytica* cysts in a certain number of persons, and had succeeded in infecting kittens with dysentery from their stools. These persons had never been out of this country. In the examination of a total 2137 persons of different ages, 3·4 per cent. were found to harbour *Entamœba histolytica*. In many of these cases further investigation showed the infection to be a familial one. Dr. Smith concluded that the presence of *E. histolytica* does not necessarily connote dysentery in the clinical acceptance of the term, but thought that a balance of tolerance might be arrived at between the parasite and the host which was capable of being broken down in favour of the parasite by adventitious circumstances.

Dr. C. E. Dukes demonstrated a modification of the sigmoidoscope, for obtaining direct cultures from the intestinal mucosa in cases of ulcerative colitis.

Thursday, July 24th.

At the second session the chair was taken by Dr. A. G. Gibson. Dr. R. A. O'Brien opened a discussion on

Immunity, with Special Reference to Specificity and the Influence of Non-specific Factors.

He said that his contribution to the discussion was directed from the view-point of the laboratory worker whose daily occupation was the carrying out of rigorously controlled experiments, in connexion with the production and testing of sera, vaccines, tuberculins, and other biological products, which necessitated a keen watch for the intervention of any disturbing non-specific factors. Such tests as these were fundamentally dependent upon the rigid doctrine of specificity, which was at the basis of diphtheria antitoxin production, gas gangrene antiserum, and tuberculin and pneumococcal antiserum manufacture. Non-specific factors were encountered in the Wassermann reaction, the agglutination of *Proteus* X 19 in typhus fever, and in the Forssman phenomenon in hæmolysin production.

When an animal was immunised, the resulting production of antibody was a matter which was continued over an extended period and apparently went on after the stimulus of the antigen had ceased, presumably by a continued action of the body cells. It had recently been asked if such output of antibody might not be stimulated by non-specific means: this view had been put forward notably by the Copenhagen workers who claimed to have stimulated the production of diphtheria antitoxin by injection of manganese chloride. In the hands of the speaker and his colleagues no such results had been obtained, and in like manner peptone injections had given negative results. At the same time a certain amount of evidence existed that the phenomenon of antibody production was susceptible of being controlled or directed into certain channels by the simultaneous presence of more than one antigen. As a result of many experiments no evidence was forthcoming that non-specific agents either caused a release of antibodies or in any way modified the course of acute experimental infections. The clinical standpoint was one much harder to evaluate as the conditions of laboratory experiment could hardly be reproduced here, and the psychological factor was a disturbing one. The physician was faced not only by the problem of ascertaining the true result of his experiment, but by the more urgent one of curing his patient. There seemed, however, to be a considerable weight of evidence in favour of some good results being achieved by *non*-specific therapy in asthma, hay fever, and allied conditions. The matter was one for further development, and however little it appeared in accord with our present rather rigid views of specificity, the lesson of Loeb's "fatherless frog" must warn us against too ready incredulity.

Dr. P. Hartley spoke especially of the chemical aspect of the question. He emphasised the enormous degree of specificity associated with the immunity reactions in certain directions, which far out-distanced chemical methods of investigation—e.g., in the differentiation of proteins. The matter was, however, closely allied to the chemistry of the proteins, which alone caused the immunity response and gave the immunity reactions. The two explanations of the phenomena in the field were Ehrlich's chemical conceptions and the more modern physical ones, which, however, failed completely over the question of specificity. When proteins, such as sera, were submitted to ordinary chemical analysis, and their amino-acid constitution investigated, such immunologically different varieties as ox and horse serum gave identical results. When serum was split up into its albumin and globulin fractions a difference appeared between the two fractions, involving mainly the cystine and lysine distribution, but no difference could be noted between euglobulin and pseudo-globulin. Euglobulin was probably pseudo-globulin plus the lipoids of the serum. When studied immunologically, however, the albumin and globulin fractions were sharply different, and there was also well-marked differentiation of the globulins, although there was here some overlapping. Evidently ordinary chemical resolution into the constituent amino-acids did not therefore throw any direct light upon the problem of immunological specificity, and the present-day tendency was to look to the internal structure of the protein molecule as a more profitable subject for examination. The procedure of protein racemisation altered the biological characters of the protein used, and these changes were found to be associated with changes in the optical activity of certain of the constituent amino-acids when the proteins were subsequently hydrolysed. Thus, proteins of the same chemical composition, such as caseinogen from two different animals, when split up after such treatment might resolve in different ways, the resulting products not being identical, and the suggestion was made that these differences might be at the basis of specificity. Some recent work by Avery and Heidelberger had shown that from autolysed pneumococci of the immunological type 2, a soluble specific precipitin for type 2 antiserum might be extracted. This substance was peculiar from the point of view of the present problem in being an impure carbohydrate with only a very low nitrogen content. It would not stimulate antibody production although giving a specific reaction with the type 2 serum. This work appeared to open up a rather different field, and might aid in the resolution of the problem which appeared to be bound up with the chemical structure of the proteins, the most difficult of all the problems in pure chemistry.

Prof. T. J. Mackie spoke of the varied degree with which the problem of specificity applied over the field of pathology. Specific reactions in the case of typhoid were effective for all bacilli of this group, whilst in the case of *B. coli* it was a much narrower affair, being here generally an individual property of each strain. The possibility of stimulation of non-specific antibodies, which were known to exist, by heterologous antigens must be considered, as well as the effects on the general metabolism of parenteral injections.

The speaker went on to consider instances of non-specific effects which were well known, such as the stimulation of latent typhoid agglutinins in inoculated soldiers by some other infection. More striking were the recent claims made out for the stimulation of antibodies by chemical substances and especially those of Walbaum and Madsen for the enhancement of diphtheria antitoxin production by manganese chloride, which work was disputed by many observers. Personal experiments with hæmolytic antibody, on these lines, had given irregular and inconstant, but in certain cases definitely positive, results; the increase in hæmolysin being occasionally as much as ten times the original titre. The increase, when present, was a temporary one which disappeared in a few days. In other cases normal serum was found to have a weak non-specific protective effect against diphtheria toxin, especially in the case of the local lesions.

Prof. W. J. Tulloch said that there were two points of view of specificity—firstly, specificity in diagnosis, and, secondly, specificity *in therapeusis*, and that the debatable ground lay between these two standpoints. He believed that there were no structural differences between the types of antibody and that theoretically any of the immunity reactions might be used for diagnosis; which one was preferred was a matter of convenience. In many cases such diagnostic procedures were not specific and bore no relationship to immunity—e.g., in the Weil-Felix reaction for typhus and the modern Wassermann reaction for syphilis. There was too great a tendency to be blinded by the main and clamant facts in any case of disease, and to neglect the minor but contributory ones. Diphtheria was not solely an intoxication; there was the factor of infection also to be reckoned with. In this disease antitoxin was only a partial antigen, but fortunately it was effective. In studying disease the mechanism of infection must be considered, along with the mechanism of the production of lesions and of death, to obtain a comprehensive picture of it. In tetanus there is, besides the main toxic factor, the neurotoxin, a secondary though slight leucotoxic aggressin effect, which unlike the toxic factor is specific for the different agglutination types of the bacillus. Greater toxin specificity is illustrated in the botulinus group where the toxin is specific for each bacterial type. Agglutination reactions from the therapeutic point of view are, therefore, ultra-specific in tetanus and diphtheria, but intra-specific in tubercle. In meningococcal infections a middle position is probably the case, for here serological differences seem of therapeutical importance.

Dr. **Stanley Davidson** spoke on the alteration of the qualities of antigens by physical and chemical agencies, especially with reference to the effect of "detoxication" and "defatting," as suggested by D. Thomson and G. Dreyer, respectively. A large series of experiments was detailed in which the agglutinins and complement-fixing antibodies produced, in comparable series of animals, by these preparations were compared with those produced in response to the injection of ordinary killed bacterial suspensions. Rabbits were the animals used and *B. suipestifer*, a well-known pathogenic agent for the rabbit, the organism utilised. The results showed very strikingly the inferiority of the treated organisms as provokers of this class of antibody response; agglutinins, which were abundantly produced by the ordinary vaccine, being produced only by a few animals and in very small amounts where the defatted or detoxicated antigens were employed. The same was true, to an even more marked extent, in the case of the complement-fixing bodies. As regards actual protection, only one animal of the whole series survived the test dose, and this was one which had had the unmodified vaccine and had produced the greatest amount of antibody as estimated by in vitro methods.

Dr. D. **Campbell** spoke of the clinical aspect of specificity, and remarked that natural immunity was often due to factors quite other than specific ones in the sense used in the discussion. He also emphasised the fact that vaccine therapy was not now advocated in diseases in which the causal organism was well known, such as typhoid and pneumonia, but in obscure conditions in which the relationship of the disease to the organisms in the vaccine was extremely doubtful. He spoke on non-specific protein therapy in relationship to rheumatoid arthritis, and considered it the most valuable agent in the physician's armamentarium. The rationale of the treatment seemed in the production of a general reaction in which temperature, leucocytosis, and a possible mobilisation of enzymes played a part. The improvement which resulted was generally in correspondence with the degree of reaction which was provoked. Whilst not claiming that the method removed fibrous adhesions, or resulted in a repair of anatomical changes, he believed that it definitely resulted in an arrest of the progressive nature of the condition.

Dr. E. M. **Dunlop**, who had worked with Dr. Campbell, the previous speaker, said that typhoid vaccine was used in these cases. Detoxication damaged the antigenic properties of the vaccine, and its injection did not result in the production of agglutinins and complement-fixing antibodies. In certain cases rather untoward reactions had developed, but in one of these there was a suspicion of a previous typhoidal infection. There was no evidence that detoxicated vaccines would release antibodies in patients who had these in a latent state.

Dr. R. **Row** detailed some experiments upon the various fractions obtainable from tubercle bacilli. Complement fixation had failed in his hands with the waxy and ether-soluble bodies, but was generally positive with the non-acid-fast residue. Experiments on the antigenic value of these latter substances for guinea-pigs led to the view that they did somewhat increase resistance to subsequent infection. In cases of natives treated in India by injections of material of this sort some improvement was observable, especially in cases of glandular tuberculosis.

Prof. C. H. **Browning** stressed the importance of the individual factor in animal experiments as a point well recognised in the human subject but one generally overlooked in laboratory animals. There was a temptation to regard the animal too much as an unvarying reagent. He had been struck by the flat contradictions which the discussion of non-specific factors had brought out. Where competent investigators obtained different results it would be more profitable to pursue these investigations and seek out the causes of difference than to leave existing contradictions. Koch dogmatically stated, in his tuberculin researches, that he had cured his guinea-pigs, and up to the present time no explanation of these unconfirmed results had ever been forthcoming. Dr. Campbell had introduced the clinical aspect of the non-specific side of the discussion, and the speaker had seen many of these cases which had been spread over a long period, and from the point of view of an observer he had found them impressive. He also mentioned that Prof. Ralph Stockman, who was an exceedingly cautious and critical observer, considered the method the most satisfactory one in existence for the treatment of arthritis deformans. The discussion on immunity was a hardy annual in pathological circles, and he considered that the most promising fact of recent discovery in the field of immunity was that of the association of antigenic properties with non-protein substances.

Reply.

Dr. **O'Brien**, who replied briefly, said that he was strongly of the opinion that at the present time coöperation between the immunologist and the biochemist was of the greatest importance. Much of the clinical evidence adduced in support of one or other view of the therapeutic value of different methods of immunisation was utterly valueless, as the necessity for adequate control was not always realised upon the clinical side. He was impressed by Dr. Campbell's work and thought that a thorough investigation of other current methods of treatment upon critical lines, and over a sufficiently long period, would be of the greatest value.

Friday, July 25th.

At the third session the chair was taken by Prof. T. J. **Mackie**.

Prof. M. J. **Stewart** read a paper on

Xanthoma and Xanthosis.

He said that these conditions were due to an excessive accumulation of lipoids which were deposited in the tissues, in the first place in large phagocytic cells, which had a characteristic "foamy" appearance. He exemplified such local deposits by xanthoma diabeticorum, which was a local manifestation of a condition of hypercholesteræmia. The localisation of the tumours was probably determined by trauma, after which the effused and deposited lipoids were taken up by phagocytic cells. The condition was a persistent one, as might be expected, and disappearance of the cholesteræmia did not result in disappearance of the tumours. Another example was the "strawberry gall-bladder" which was first described by Sir Berkeley Moynihan, who pronounced it to be a dusting of the surface of the gall-bladder with gall-stone material. The small polypoid projections here seen were pendulous collections of foamy cells, gorged with cholesterin. The speaker thought that these might act as originators of the mulberry type of gall-stone, which was preponderatingly a cholesterin stone. Cholesteatomata of the choroid plexuses were not uncommonly found as incidents in a post-mortem examination. These little tumours presented the same structure as the allied formations found elsewhere, consisting of masses of foamy lipoid-containing cells. In the later stages of their existence the cells dissociate and free cholesterin was deposited.

Atheroma was a closely connected condition. Here a deposit of cholesterin was a constant feature of the early atheromatous plaques, and a like condition might be produced by feeding animals with cholesterin. All these conditions might be looked upon as examples of local deposits, determined by a general condition of hypercholesteræmia. In the morbid states now to be described the local deposits were not accompanied by any general metabolic change. "Myelin kidney" was an example of the latter type of disease. Here there was an extensive deposit of lipoid between the cortex and medulla of the kidney. In an early stage this substance was intracellular, and foamy cells were seen. The speaker regarded this condition as a special modification of subacute nephritis; in the early stages the lipoid could be seen in the renal epithelium and it was on disintegration of this that it was deposited in a free state. In panniculitis the same foamy cells were found as the result of a low-grade inflammation of the subcutaneous fat. The myeloid tumours of tendon sheaths often contained the same lipoid-filled cells, and it had been held by some that they were really xanthomata. The speaker pointed out that the true xanthomata of tendons were found in general xanthomatosis and were quite distinct from the myeloid tumour. His view was that the foamy cells occasionally seen in the latter represented a phase of degeneration in an endothelioma.

Dr. ARCHIBALD LEITCH read a paper on

Mule-Spinners' Cancer and Mineral Oils.

He pointed out that 20 per cent. of the cases of scrotal cancer occurring in this country were present in mule-spinners and that an additional 6 to 7 per cent. were in chimney-sweeps. No other occupation had an incidence of over 2 or 3 per cent. Certain mineral oils, shale-oil in particular, had the capacity for producing tumours in mice. Most lubricating oils contained a high percentage of petroleum oils which had also been found to produce the same result. The time taken to produce carcinoma by lubricating oil was greater than that taken by any other agent yet tried successfully for this purpose. The results varied with the different fractions employed, those distilling at a high temperature being more active than the more volatile fractions; this statement was also true of the more active shale oils, so it could be concluded that it was in these fractions that the active agent chiefly resided. With regard to the localisation to the scrotum, the speaker held that it might be due to the large sebaceous follicles there present, and thought that following a period of exertion and sweating material from the surface might be drawn into these follicles and act there. In chimney-sweep's cancer the active factor lay not in the carbon particles of the soot, but in a fraction which was soluble in sebaceous material, and with such a product carcinoma had actually been experimentally produced.

In the discussion which followed Dr. W. F. DEARDEN said that he had 30 years' experience of cotton mills. It was a curious thing that within the cotton trade itself knowledge of the disease was practically non-existent, largely because the spinners tended to conceal it, and hence the problem of prevention had scarcely yet been faced. There was no doubt that the men became saturated with oil from the cotton trousers worn when at work. The oil was not derived from the faller bar, as had been stated, for a boy was employed to keep this clean from oil, but was derived from the spindle bearings which sent off a fine spray of oil. The effect of the faller bar might be to press the oily trousers against the scrotum.

Dr. S. A. HENRY said that industrial epitheliomatous ulceration of the skin was a notifiable disease, but that epithelioma of the scrotum was not usually notified, probably on account of failure to recognise that the disease was an industrial one. The disease was one of very slow development; the earliest case he had found developed after 19 or 20 years' continuous employment in a mill. Change of occupation after a long period of spinning did not mean indemnity from the disease, as experimental work had shown in mouse tumours. He asked if Dr. Leitch could give any information as to the prevalence of this disease in America.

Reply.

In reply to a number of questions raised by different speakers, Dr. LEITCH said that cases of chimney-sweep's cancer were very few and he had not had an opportunity of demonstrating soot in relation to the sebaceous glands. Sebaceous material alone did not appear to have any carcinogenic qualities. With regard to scrotal cancer amongst cotton-spinners in the United States he had made careful inquiries, but had only succeeded in hearing of two cases. One possible explanation might be that the employees in that country did not spend as long a time at the same occupation as they did in this, where it was quite usual for cotton-spinners to pass their whole lives in the same trade. The location of cancer in the scrotum might be explicable upon the lines of its being a seat of election. In animals it was easy to produce epithelioma in one site, but more difficult in others.

Dr. J. E. MCCARTNEY read a paper on the

Criteria of Transmission and Cultivation of Encephalitis and Allied Viruses.

He pointed out the divergent results claimed by various workers with human encephalitis material. On the one hand, Strauss, Hirshfeld, and Loewe, in America, and Kling and Davide, in Sweden, obtained frequent positive results similar in type and not necessarily causing symptoms or death of their experimental animals, but nevertheless producing well-marked lesions in the animals' brains. Levaditi and his associates, in France, claimed positive results of a different nature, after a different incubation period, accompanied by symptoms in the animal and finally by its death. It had been noted by Bull that in certain normal rabbits lesions were found in the brain akin to those described as specific for the encephalitis virus, and at the suggestion of Flexner the speaker examined nearly 400 rabbits from the Rockefeller Institute with the object of ascertaining if lesions were present in normal animals, and in animals the subjects of other infections, of the same nature as those obtained by the workers with human encephalitis and what might be their prevalence. He found in all the different categories of animals examined that such lesions might be detected. These were of several types: (1) The perivascular infiltration with round cells, familiar to all workers at encephalitis; (2) similar submeningeal infiltrations; (3) sub-ependymal collections of the same nature; and (4) focal aggregations and general infiltrations of round cells, sometimes associated with areas of necrosis. On an average such lesions were detected in about 50 per cent. of all the animals examined. Cultural experiments in such cases had proved uniformly negative both by ordinary methods and by the Noguchi method. In certain experiments with accredited viruses of encephalitis and herpes cultural experiment had also proved negative, and it had been shown that the survival of the virus in Noguchi medium, which had been claimed as suitable for its cultivation, was of shorter duration than in ordinary broth.

Prof. **Browning** felicitated Dr. McCartney on having carried out a very laborious piece of work of an especially praiseworthy variety, since its results were negative. He had been watching work of a similar nature upon disseminated sclerosis and believed that the pitfalls which had been pointed out had been successfully avoided.

Dr. **Dible** said that what Dr. McCartney had done was to carry out the controls which other workers had failed to provide for. It did not, however, follow that his findings were universally applicable. The speaker had examined the brains of many rabbits, in Manchester, in the course of attempts to transmit human encephalitis and had not found these lesions. The explanation probably was simply that they were dependent upon an infection, which might be present in some areas and in some breeding houses but not in others. He thought that it was time to call in question much of the work that had been put forward with positive findings in this field. A large amount of published work had been built up and its foundations were very uncertain. For the last four or five years he had been trying to transmit human encephalitis to rabbits, using many varieties of material—fresh brain, glycerinated brain, and cerebro-spinal fluids—and essaying inoculations by all the routes for which positive results were claimed, and to his sorrow he had been completely unable to obtain any positive results. There was a tendency, he thought, to interpret such lesions as perivascular infiltrations in too narrow a sense. They were appearances due to anatomical and physiological conditions in the brain, which determined what the picture would be in response to infection; they might be occasioned by many infections—this was a commonplace—and they were certainly not to be looked upon as specific of any single infection.

Dr. J. **Cruickshank** read a paper upon

A Study of B. Acidophilus *in Human Fæces.*

No one, he said, could fail to be struck by the number of Gram-positive bacilli seen in films of stools and by their absence in ordinary cultures. These organisms were acid-resisting, and it was easy to cultivate them by thickly implanting fæces into broth to which 1 per cent. of acetic acid was added. After incubation, plating resulted in an abundant growth of these bacilli along with certain cocci. *B. coli*, which seemed to exert a definite inhibitory effect on the growth of these organisms, was killed off. The acid-resisting organisms of this type constituted the aciduric group, to which *B. bifidus* was closely allied. Forty-four strains had been examined and an attempt made to group them by sugar reactions, but this was not satisfactory on account of the multitude of types which resulted. Agglutination had been no more successful, but types absolutely identical by sugar reactions appeared also identical with regard to agglutination. Many different types might occur in the same stool. There was much confusion over the whole group and he did not think that any of the members showed a real preference for anaerobic conditions.

Dr. R. P. **Smith** read a paper on the

Isolation and Implantation of B. Acidophilus.

He had endeavoured to implant pure isolated strains of *B. acidophilus* in the intestine in typhoid carriers for therapeutic purposes. This was successful as long as feeding with the organism was maintained, but when this was stopped the bacilli quickly disappeared. Feeding with lactose prolonged the period of persistence of the organism. Attempts were also made to implant *B. lactis aerogenes;* these failed, except in a case in which the feeding was associated with vaccination with this organism. As a therapeutic measure such implantation relieved chronic constipation, but did not affect the presence of *B. typhosus* in carriers.

Dr. R. **Row** read a paper on the Experimental Transmission of *Leishmania tropica* to Mice by Feeding. Only certain regions of the intestine showed any lesions as a result of this, these appearing mainly in the lymphoid follicles of the jejuno-duodenal junction. The transmission of the disease by biting insects was at present discredited, and from the experiments discussed he did not draw any positive inferences in favour of an intestinal origin for the condition.

SECTION OF DISEASES OF CHILDREN.

Wednesday, July 23rd.

This section met on two days, Dr. **Leonard Findlay**, the President, being in the chair. At the first session Dr. A. F. **Tredgold** (London) opened a discussion on

Prevention of Mental Deficiency.

He confined his remarks to mental deficiency as defined by the Mental Deficiency Act of 1913. He said that mental defectives could be divided broadly into two groups, primary and secondary. The essential cause of primary amentia was a diminished developmental potentiality of the cerebral neuroblasts, which was germinal in origin and was inherited or transmitted. Two chief views were held as to the nature of the germ change: (1) That the change in the germ plasma was "defect mutation," which was inherited as a Mendelian recessive; (2) that the change consisted in a form of germ devitalisation, the result of injurious factors of the environment (e.g., lead, mercury, tuberculosis) acting upon the germ cells or impairing the growth potentiality of the neuronic determinant. This impairment was manifested in varying degrees—defective function (hysteria, epilepsy, mental instability), defective durability (chronic forms of insanity, dementia præcox, pre-senile dementia), and defective structure (varying degrees of mental defect or subnormality). An additional embarrassment due to birth injury, antenatal or postnatal disease might bring about mental defect where the innate tendency to impairment of development was only slight. In his opinion, the latter view was the better one and was most in harmony with our present pathological, clinical, and genealogical knowledge. It should be noted that it was not the mental defect but the impairment of developmental potentiality or germ neuronic determinant—i.e., the neuropathic diathesis—which was inherited or transmitted.

In speaking of prevention, he said it was often assumed that to prevent mental defect it was only necessary to sterilise or segregate mental defectives. This was a mistake, for, whichever view was adopted, the Mendelian or the theory of germ impairment, segregation, or sterilisation would be attended with only limited preventive results. On the Mendelian view Punnett had shown that, assuming an initial proportion of one mentally defective per 100 population, these methods would have to be continued for 22 generations to reduce the proportion to 1 per 1000. If the view of germ devitalisation was adopted it was clear that the sterilisation or segregation of certifiable defectives could only be attended with limited results. These methods would only prevent those cases which are the offspring of mentally defective parents, and the proportion of these is relatively small. To produce any appreciable preventive result it would be necessary to sterilise all those who suffered from the neuropathic diathesis—an impracticable and impossible proceeding. As a policy segregation was better than sterilisation; mentally defectives were antisocial and therefore must be segregated for their own sakes, sterilisation being then unnecessary. If sterilisation were relied upon it would mean the setting free of many people who should be under control. Birth-control would certainly not prevent mental deficiency; on the contrary, there was every reason to think that it would increase the number of cases. What was needed at the present time was not the indiscriminate advocacy of birth-control, but the encouragement of the multiplication of the biologically sound and fit, and the discouragement of the unsound and unfit.

Raising the question of the possibility of prevention of germ deterioration, he said that as long as it was assumed that this arose by mere chance or from unknown causes, nothing could be done, but if the assumption that it was due to faults of the environment be correct, then it came within the sphere of practical preventive medicine. Secondary amentia differed from primary amentia in that the germ plasm was normal and there was no morbid heredity: it was produced by adverse causes of environment acting directly upon developing embryo or young child; more antenatal research was essential. In cases due to vascular brain lesions the lesions were generally produced during birth and therefore called for improvement in methods of delivery. He asked whether operation would be possible in these cases. More research was also necessary in Mongolism and into the bacteriology and treatment of these cases resulting from toxic or inflammatory brain lesions. In cases due to syphilis treatment of the child was of no value; the parents of the child should be tested for evidence of the disease and treatment applied to them.

Dr. ERIC PRITCHARD (London) said that if the germ plasm could be injured by noxious influences—e.g., lead, mercury, &c.—and the influence continued through several generations, it was only logical to suppose that when these influences ceased to damage the germ plasm through many generations these inborn traits would breed out. The feeding experiments of Mendel, McCollum, and others showed that food could influence germ-plasm growth and reproduction, and it was therefore logical to assume that the nerve elements in the germ plasm would be affected to a greater degree. Food accessory factors, particularly vitamin-B starvation, might be one of the most potent causes of injury to the germ plasm in successive generations. With regard to Mongolism, he would draw attention to a recent paper in the *American Journal of Diseases of Children*, in which it was suggested that the condition was a primary one. The author investigated the case of Mongolism in 18 pairs of twins: in two cases only were both twins Mongols and these were homologous twins; all the other were heterologous twins. Under these circumstances, it was impossible for the condition to be a secondary one. Mongolism could not be due to germinal influences, for it is rarely seen in families and rarely in more than one child of the same mother. He wished to ask Dr. Tredgold, therefore, if he was convinced that Mongolism was secondary.

Dr. ROBERT HUTCHISON (London), speaking purely from his clinical experience of 150 private cases, said that the classification of mental deficiency into primary and secondary forms was a purely arbitrary one. Secondary forms simply meant those in which the cause was known, and primary those in which it was unknown. It was absurd, therefore, to classify Mongolism as a secondary form, because its cause was unknown. He classified his cases purely on clinical grounds, and of the 150 cases Mongols formed 35 per cent., epilepsy 6 per cent., cretins 6 per cent., and primary amentia 45 per cent. Attention therefore should be concentrated on the prevention of primary amentia and Mongolism. There was no evidence that primary amentia was hereditary and transmissible. Every one of his audience, he said, had a neuropathic inheritance, and indeed it was the only one worth having. With regard to the factors producing a damaged germ plasm, Dr. Tredgold dragged in endocrine disturbances and hypothetical toxins, while Dr. Pritchard emphasised the vitamins. These he regarded as the resources of the intellectually bankrupt: if they had nothing better to bring forward then there was no evidence of the action of toxin. Neither of the two preceding speakers had made any reference to the fact that these children were usually the first-born children: it would appear that nature made a botch of it at the first pregnancy, and after that appeared to be more successful. If these cases were to be prevented the only logical treatment appeared to be that of slaying all the first-born! Another point also not mentioned by these speakers was that the mothers of Mongols were almost always somewhat old—in 75 per cent. of his cases the mothers were over 35 years of age. Therefore, on that ground alone the only practical prevention of Mongolism would be to prevent all women over 35 having children. With regard to the other forms of mental defect, head injury cases might be prevented by early version, Cæsarean section, and appropriate measures, but they formed only 10 per cent. of mental deficiency. The very small part played by syphilis in mental deficiency had been well shown by John Thomson's statistics. He believed that mental deficiency was no more inherited than hare-lip or cleft-palate: it arose as a fortuitous variation. Every generation produced its crop of mentally deficient as it produced its great men; and in conclusion he quoted Sairey Gamp—"We were born in a wale and must take the consequences."

Dr. W. A. POTTS (Birmingham) said he could not agree with Dr. Hutchison that the inheritance of mental deficiency was disproved; how was it that if two mentally deficient people married all the offspring were mentally defective? He agreed that segregation alone would require a very long time to obtain good results, but if other factors, antenatal and natal, also received attention practical results would be obtained. As special causes in the production of mental deficiency he instanced the effect of toxic conditions—e.g., pyorrhœa during pregnancy—which were most dangerous in the first six weeks of pregnancy. Too rapidly repeated pregnancies also affected the children. An improvement in obstetric practice would lessen the number of cases of mental deficiency.

Dr. LANGDON-DOWN (London) was in substantial agreement with the arguments and conclusions of Dr. Tredgold. He agreed with him in rejecting compulsory sterilisation as a necessary or wise method for the prevention of mental deficiency. And to be effective at all, it would have to be compulsory. Segregation produced the same results as sterilisation, and fulfilled also the other conditions of the problem. To decide what class of case should be sterilised was a problem bristling with difficulties.

Dr. R. M. MARSHALL (Manchester) agreed that the neuropathic diathesis was not inherited as a Mendelian recessive, but he could not go all the way with Dr. Tredgold when he suggested that the diathesis arose from a devitalism of the germ plasm which produced certain nervous disorders and reached a culmination in amentia. This would imply that the neuropathic diathesis was a progressive condition, originating as a functional neurosis and ending as mental deficiency, and was simply a statement in modern pathological terms of the old doctrine of family degeneration. He thought that Dr. Tredgold's paper helped to establish certain points in the prevention of amentia, and that he placed the proper emphasis on sterilisation and segregation. Sterilisation was not calculated to get at the morbid process responsible for the condition, and segregation, if adopted early in life, prevented the reinforcement of certain types of society which were a burden to the ratepayer.

Dr. BERNARD MYERS (London) supported Dr. Hutchison's classification as a practical clinical one, and emphasised the importance of looking after the pregnant mother, and particularly the prevention of infectious diseases.

Dr. W. CROFTON (Dublin) said that everyone who had studied the influence of environment on the morphology of micro-organisms was convinced of the importance of environment, and he considered it was the first duty of the Government to provide minimum standards of wage, food, and housing.

Dr. A. E. NAISH (Sheffield) thought that Dr. Hutchison's view against heredity was due to the fact that he was dealing with private cases among which sporadic cases occur more than in any other class. With regard to Mendelism, he thought they should adopt the theory of non-proven rather than deny it. If Dr. Tredgold's theory of pathological change in the germ plasm—showing itself in the least degree as hysteria, in a more severe degree as dementia præcox, and culminating in amentia—were true, one would expect a large number of cases showing a mild degree of mental defect to develop into dementia præcox as they grew older.

Dr. C. F. LAPAGE (Manchester) said that there was no distinct gap between mental deficiency and lower grades of those children who were not actually certifiable. He held it was not hereditary change but rather some alteration in germ cell or in embryo. The effect of stock was undoubted in many cases.

Dr. H. B. BRACKENBURY (London) thought that there was a tendency in the discussion to deny that there was any such thing as mental deficiency. He held there was an absolute distinction between mental deficiency and backwardness or dullness, if they could be diagnosed, although he regarded the diagnosis as difficult. If our knowledge were complete we could diagnose between the two conditions.

The PRESIDENT said that the subject was chosen for discussion because the lay press often wrote as if the presence of mental deficiency was an indictment of the medical profession, and as if the profession knew how to prevent it but did not. The discussion was arranged so that a definite opinion could be given to the public, but he was afraid that that object had not been achieved. It could not be doubted that heredity played a big part in mental supply just as it did in stature, eye colour, and other traits, but mental deficiency was different. There was no concrete opinion regarding the cause. He thought congenital and acquired were better terms than primary and secondary; the problem that presented itself was the prevention of the congenital defect, since the prevention of the secondary defect was only a question of better medicine. Mental deficiency was common in better classes, and in them he had not been able to find a family history pointing to heredity. He would not be astonished if the better classes had not a larger number of mental defectives than the poorer classes, and this took the causation right away from the problems of housing or feeding. It had been suggested that with better obstetrics there would be less mental deficiency, but it was a curious fact that the more training there was in obstetrics, the more accidents there were at birth. It tempted the doctor to do more than he otherwise would, and tended towards hurry. We were spending a large amount of money on treatment of mental deficiency, and he would ask Dr. Tredgold if it were worth while. What percentage of mental defectives could support themselves?

Reply.

Dr. TREDGOLD, in reply, said that he did not know whether Mongolism was primary or secondary, but he thought environment acting on the child did have an effect; the cause was, however, unknown. Dr. Hutchison swept aside all knowledge, heredity, science, and reduced the question to one of clinical experience and of chance; but the more we knew of mental deficiency the more we saw that, although as yet unknown, there was a cause for it. There was clear experimental evidence that adverse circumstances did affect the germ plasm and that as a result the embryo was affected. He was quite definite that there were thousands of families without a neuropathic inheritance, and that it was in the unsound families that mental defectives were found. Dr. Marshall was probably thinking of school-children found in mentally defective schools—i.e., morons. If so, he entirely agreed with him, because there was a clear difference between morons and mental defectives. The moron is the lowest grade of normal, the mentally defective is a definite pathological condition. He also agreed with the President in thinking that the social class of the parents made no difference to the occurrence of mental deficiency, and therefore it was not due to housing or food. In answer to the President's question whether it was worth while spending money on the treatment of mental deficiency, he would ask what was the alternative? It was to leave these mentally defectives at large to work their will on society now and on posterity in the future. Therefore, we must segregate them, and if we must do this why not do the best we can for them? There were thousands of cases earning enough to pay for their keep.

THURSDAY, JULY 24TH.

On the second day Dr. CLIVE RIVIERE (London) opened a discussion on

Pulmonary Tuberculosis in Childhood.

He said that the original title advertised for the discussion was pulmonary tuberculosis in childhood, but that in the official handbook this had been changed to pulmonary tuberculosis in children of the school age and that his own remarks would be on that point, and he would deal with the clinical aspect of the question. He hoped that other speakers would say which part of the subject they were speaking about. For the ages 5 to 15 years the Registrar-General's report showed that the number of deaths attributable to tuberculosis was only 3 per cent. of the deaths at all ages. This low mortality admitted of two possible explanations—that there was little infection at these ages, or that children of the school age had a high immunity. He gave statistics to prove that infection at these ages was quite common, and also post-mortem figures proving that structural lesions were discoverable during these early years. The conclusion was therefore an obvious one, that there must be a notable immunity during this period of life. Among such material, infective but resistant, there must surely be in addition to a few deaths, numerous cases of disease running a more benign course and ending in recovery. How did these cases show themselves clinically and where were they found? He did not think they were found in hospitals, but they were found in tuberculosis dispensaries and in the school medical service. The tuberculous child was a type that could be recognised. There was a history of frequent coughs and colds, attacks of unexplained fever, loss of weight, anorexia, and asthenia. How were these cases to be detected? The stethoscope was useless in the diagnosis of hilus tuberculosis; it was only useful in detecting those uncommon cases of apical phthisis in children and the late stages of hilus tuberculosis, both of which varieties of the disease possessed a bad prognosis. There were, however, certain characteristic areas of dullness, the most characteristic being the right paravertebral dullness. This was as characteristic of hilus tuberculosis as apical dullness was of apical phthisis. The diagnosis of hilus tuberculosis then depended on the right interpretation of the symptoms, the finding of right paravertebral dullness by percussion and on well-interpreted X ray photographs, but not on the stethoscope. Unfortunately, the radiograph of later childhood was marred by shadows of past experience, but in earlier childhood a well-interpreted X ray was very helpful. He believed that the infection of the lung was a backward lymphatic spread from the hilus.

For purposes of discussion he would suggest some of the problems which hung around this tuberculous or sub-tuberculous school-child. First, his very existence seemed to be ignored in some quarters, and he hoped this discussion would help to establish it. Next, given his existence, came the detection and diagnosis of his disease, and following that the peculiar characteristics of pulmonary tuberculosis in childhood, and the points wherein it differed both clinically and pathologically from apical phthisis of adult type. These he had tried to outline, and they presented an interesting problem. Further, there remained the question of prognosis in the individual case, none the less difficult because the majority recovered readily. In addition, there was the question of what was to be done with the sub-tuberculous child from the administrative point of view, both in the interests of the child himself and of the community. Finally, there remained the very important and interesting question of what eventually became of him, particularly on his emergence into adult life. Did he recruit the ranks of phthisis in the adult, or was he, as some believed, peculiarly immune to further tuberculous disease? Or were there, perhaps, cases which were protected by their childhood disease, and others in which it had obtained so firm a foothold as again to become active in the guise of a hilus tuberculosis of adult life? These among many he would suggest as suitable problems for discussion within the limits of the subject-matter.

Radiological Aspect of Pulmonary Tuberculosis.

Dr. **CAMPBELL SUTTIE** (Glasgow) spoke on the radiological aspect of pulmonary tuberculosis and dealt particularly with children under 5 years of age. He said that in the experience of the radiological department this was a comparatively uncommon and invariably fatal disease. The majority of those infected died in hospital and the disease usually lasted but a few months. He gave a detailed description of the technique employed, and said the radiogram gave accurate pictures of small peripheral and larger central lesions which had reached the stage of consolidation or cavitation before the corresponding physical signs could be detected. Progression of the disease was evidenced by the increasing opacity of the abnormal shadows, their spread in extent, their edges becoming less distinct owing to surrounding consolidation, the signs of cavitation in their centres, and by the appearance of abnormal shadows in the other lung.

From the radiographic standpoint there were four types of tuberculous infection: (1) Miliary tuberculosis; (2) broncho-pneumonic tuberculosis (Types A, B, and C); (3) hilus tuberculosis; (4) chronic phthisis (adult type). In miliary tuberculosis the chest was normal in contour and the X ray findings were negative. The hilum shadows were not more prominent than those found in supposedly healthy children, and yet at post-mortem examination there might be miliary tuberculosis present throughout the lungs with enlarged mediastinal glands. He did not think that tuberculous glands showed radiographically unless they had passed the stage of congestion or enlargement and had become caseous or calcareous. In broncho-pneumonic tuberculosis (Type A) the hilus shadows were almost invariably increased, and the whole field of both lungs dotted with rounded, sharply-defined areas of opacity, almost all of the same size and equally distributed. The size of each of these shadows varied with each case, from about 1 mm. to 3 mm. in diameter. They did not seem to coalesce until the individual lesion exceeded 3 mm., thereafter over large areas of lung dense shadows were produced, followed immediately by appearances indicative of cavitation. Acute broncho-pneumonic phthisis (Type B) was rare. Radiologically it was indistinguishable from a broncho-pneumonia which was breaking down, except that both lungs were not usually infected. Large cavities might be formed and spread the infection to the other lung. In Type C there was occasionally and usually in the lower lobes a caseous area which might have been the focus of the miliary spread. Hilus tuberculosis was more uncommon, and began as an increase in the size and opacity of the hilus shadow. Occasionally both were involved, but one increased at a much more rapid rate. Eventually the opacity might reach the lateral chest wall, but before this occurred an irregular area in the centre showed increased translucency, and within a short time a large irregularly-shaped cavity was seen. In tuberculosis of the lung with broncho-pneumonic or hilus type in infancy a unilateral chest infection had not yet been seen. The evidence of chronic tuberculosis in childhood was seen first as an increase in size and opacity of the hilus shadow. This opacity finally extended to the apex of the affected side as an elongated branching shadow showing at intervals along its course circular opacities with fairly well-marked outlines. These shadow areas were not discrete, but communicated with each other, and at the apex or below it there was an area of consolidation with at a later stage cavity formation.

In diagnosis he emphasised the difficulty of the apparently normal variations in extent and density of hilus shadows and the shadows caused by the bronchi and their vessels. Also the difficulty in diagnosing other bacteriological shadows such as the increasing hilus branching shadows, which may persist for many years after measles, whooping-cough, and influenza. The lung picture might be due to other processes, such as unresolved pneumonia. He stated in conclusion that he believed the broncho-pneumonic Type A to be the most common form of pulmonary tuberculosis in children detectable radiologically, and that it produced the radiogram on which alone a diagnosis can be made with reasonable certainty.

Dr. **LAPAGE** said he believed that children of the school age showed a high immunity to pulmonary tuberculosis. Hilus tuberculosis at the school age, particularly the mild form, was difficult to diagnose, and in diagnosing it he would lay stress on the following points: (1) The importance of the toxic state—e.g., headache, pallor, debility, after the elimination of all other possible toxic causes. (2) The appearance of the child on examination, there was a loss of tone of the whole system, the child "looked shabby," the skin was dry and dirty, there was a growth of downy hair on the back, a loss of tone of ligaments, flat-foot, and exercise tolerance was poor. Prof. Lorrain Smith stated that there were pathological changes in the muscle. (3) A history of exposure to infection. He believed that the infection was via the bronchial mucous membrane, to the glands, and later retrograde infection of the lung. (4) On percussion, paravertebral dullness might be present in healed or active tuberculosis. On auscultation he thought D'Espine's sign was useful. (5) An X ray examination; the interpretation of this was, however, difficult. (6) The reaction to treatment—if a child improved greatly on rest, climate, and dietetic treatment, the diagnosis was confirmed. He made a plea for more schools for children for the lengthy treatment of mild cases of hilus tuberculosis.

Dr. **C. W. VINING** (Leeds) said it was important to distinguish between tuberculous infection and tuberculous disease. Impaired health was too commonly put down to tuberculosis. Localised tuberculosis did not affect the health very greatly; if ill-health were present it was due to toxæmia, which meant a severe and spreading lesion, and the majority of such cases died. He would like to know what percentage of school-children in cities showed the signs Dr. Riviere had described; he thought that post-mortem statistics from a general hospital were more likely to express the disease incidence in the community than statistics obtained from children's hospitals. He therefore had examined the post-mortem records at the Leeds Infirmary of cases from 5 to 14 years of age. Of 103 cases in which death was due to accident or burns, tuberculous lesions were present in 14 per cent., and only four cases showed intra-thoracic lesions. He did not understand how enlarged bronchial glands could produce paravertebral dullness. Dr. Riviere had said that this was due to alteration in the surrounding lung, but it was difficult to see how this was brought about, because the root of the lung was tucked away deeply in the chest and covered over by a mass of lung tissue.

Dr. **CHARLES MACNEIL** (Edinburgh) said that the type of child spoken of by Dr. Riviere was the common type of latent tuberculous disease in children of the school age. The diagnosis was important because these cases were amenable to treatment. In his opinion children of the school age were diagnosed as suffering from chronic tuberculosis in far too large numbers. Raising the question whether it was possible to diagnose mediastinal glandular tuberculosis, he said that if Dr. Riviere's claim for right paravertebral dullness were sound it was an important contribution, but it was the last of a series of signs that had been offered, such as Eustace Smith's murmur, D'Espine's sign, parasternal dullness, all of which were now largely discredited. He was entirely unconvinced that paravertebral dullness was any better than these other signs. The objections he had to it were that it was not a true dullness, it was only impaired resonance, and that normally there was along the vertebral border an area of impaired resonance. There was no local sign that was generally available and the diagnosis was very difficult, indeed, it was often rather a probability than a certainty, but if a child gave a positive von Pirquet's reaction and did not show any evidence of pulmonary or other disease, but had signs of general ill-health, it could be presumed that the child was suffering from tuberculous bronchial glands.

Dr. F. G. **CHANDLER** (London) said that pulmonary tuberculosis did occur in infancy and childhood, and that mediastinal glandular tuberculosis was common. At post-mortem there was frequently evidence of old tuberculosis in the mediastinal glands and therefore there must have been disease earlier in life. The absence of mortality between the age of 2 and 14 did not imply non-infection. Was it possible that tuberculosis destroyed the most susceptible before the age of 2 and then dealt gradually with the rest? Marked symptoms of tuberculous disease were not infrequently found at 15 years, therefore the disease must have been present before that time. There were many slight warnings of this tuberculous state which had been well defined by Riviere as sub-tuberculous, but it must not be thought that every case of malnutrition in childhood was due to tuberculosis. He stressed the importance in diagnosis of a barking, dry, paroxysmal cough at night, failure to gain weight, toxæmia as described by Dr. Lapage, paravertebral dullness, diminution of Krönig's bands, and the importance of sputum examination. If it were not possible to obtain sputum the fæces should be examined. In the absence of uninfected food, the findings of tubercle bacilli in the fæces was diagnostic of pulmonary tuberculosis. The X rays, unfortunately, gave the least help in the diagnosis of those cases where help was most required. As to prevention there should be avoidance of infection, a pure milk-supply, early diagnosis, and more frequent routine examination than were undertaken to-day.

Dr. W. B. **CROFTON** (Dublin) said that 25 per cent. of all cows supplying milk to London were tuberculous, therefore practically all the milk in London could be regarded as tuberculous. He stressed the difficulty of diagnosis of pulmonary tuberculosis in cases where no tubercle bacilli were found in the sputum, and also the importance of the subcutaneous tuberculin test as a help in diagnosis. His experience with his own antigen was that he had never known a case which developed tuberculosis, if after three or four days the reaction was negative.

Dr. J. A. **WATT** (Derby), speaking of children of the school age, said that he agreed with Dr. Riviere that hilus type of infection was the common form of the disease, and also that right paravertebral dullness was present in these cases. He thought D'Espine's sign was of great value and also the examination of the sputum, but the latter must be done by concentration methods. 45 per cent. of hilus cases showed tubercle bacilli by these methods and the mortality after four years of this group of cases was small, whereas of 60 cases of the adult type of infection which developed from 10 years onwards, 80 per cent. had died in four years. As to the future of cases of the hilus type, he believed that it developed into adult tuberculosis in after life, and he thought public money would be better spent in treating these children than in treating adult tuberculosis.

Dr. **ERIC PRITCHARD** thought that the diagnosis of this form of tuberculosis required simple means and that the refinements of percussion as suggested by Dr. Riviere were too great. He had had great success with subcutaneous test and did not know why it was not more used. He found no danger in it, but it must be remembered there was a difference between the bovine and human type of infection. A focal reaction was of great diagnostic importance. If there was a general reaction only, then the child must receive specific prophylactic treatment. Malnutrition must not be regarded as an essential point in diagnosis, since tuberculosis occurred in quite well-nourished children. He had used tuberculin prophylactically with great success, and of 40 cases in infants exposed to infection, who gave a focal or general reaction and to whom he had given a six months' course of tuberculin, all were now alive. This disproved Hamburger's and Monti's statement that 90 per cent. of all infants infected with tuberculosis died.

The **PRESIDENT** said that the discussion had been comprehensive, but the subject chosen for discussion was not tuberculosis in children but pulmonary tuberculosis, and he wished speakers had stated more definitely the type of case they were discussing. What we wanted to know was how frequently we met with pulmonary tuberculosis. Physicians in children's hospitals saw every form of case and therefore the children's hospital could be taken as supplying evidence as to the frequency of the disease. In Glasgow tuberculosis of the lungs during school age was rare. When it was diagnosed death soon occurred. If cases of mediastinal gland tuberculosis were classed as pulmonary tuberculosis, then, of course, it was much commoner. Tuberculous mediastinal glands was one of the most difficult diseases to diagnose. Evidence of improvement when country life was substituted for town life was not evidence that tubercle was present. It was questionable whether with all precautions it was possible to get tubercle-free milk; sterilisation of milk was therefore essential.

Replies.

Dr. **SUTTIE**, in replying, said that his remarks were based on a large number of radiological examinations. About 1000 radiograms of chests were taken every year. He could not say that an X ray examination was any help in the diagnosis of enlarged mediastinal glands unless these were very large or calcareous. As a matter of fact, all forms of pulmonary tuberculosis except the broncho-pneumonic type could be simulated by other diseases.

Dr. **RIVIERE**, in replying, said that, in answer to Dr. Lapage, symptoms could never be anything more than mere indications for examination, although it was necessary to rely on them for evidence of activity of the disease. He thought Dr. Vining's figures substantiated his own view that many cases ought to be found in practice. He agreed that there was no sufficient explanation of paravertebral dullness, but thought it was probably due to enlargement of the bifurcation glands pressing on the right pulmonary artery and resulting in under-expansion of the right lung. He had not often been able to find tubercle bacilli in the sputum, and in answer to Dr. Crofton's remarks about tuberculin, he thought that most people agreed that a mere general reaction was not of great value, although a focal reaction was important, but he had not used this method in children. He did not agree with Dr. Watt that hilus tuberculosis of children became the adult type of tubercle, but he suggested that it might give rise to those deep cases of tuberculosis seen in adults.

In answer to the President, he said he himself had found these cases did not go to children's hospitals, but were sorted out in schools and sent to dispensaries for tuberculosis or to chest hospitals, but possibly in Glasgow conditions were different.

THE annual meeting of the Medical Sickness, Annuity and Life Assurance Society will be held at Lincoln House, 300, High Holborn, London, W.C. 1, on Monday, Oct. 6th, at 4 P.M.

Special Articles.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Pensions of Poor-law Medical Officers.

THE Local Government Bill, introduced to the Dail last session, proposed to repeal all existing enactments dealing with the superannuation rights of Poor-law medical officers, and to substitute conditions much less favourable. Representations made to the Minister have convinced him of the injustice of this proposal in so far as it affected existing officers, and he has decided to propose amendments to protect their interests. In reply to a query as to his intentions from the Secretary of the Irish Medical Association, an official letter from the Ministry states: "The Minister desires me to state that he has decided to introduce into this Bill amending clauses which will fully preserve all the present rights to superannuations or gratuities on retirement of officers holding office at the date of the Bill passing into law."

A manifest injustice to existing officers is to be avoided, but the profession will not be satisfied that worse conditions as regards pension should be applied to future officers than are in force at present. The public services of Ireland need to be rendered more attractive rather than less so if the medical system is to be efficient.

The Position of the Medical Profession in the Free State.

Dr. Hennessy, Medical Secretary of the Irish Medical Committee, addressing a largely attended joint meeting of the medical practitioners of the counties of Wicklow and Wexford which was held recently, discussed the legislative proposals of the Government and the adverse conditions likely to occur if the profession were not immediately organised on a thoroughly satisfactory basis. The following pledge, already adopted by the counties of Kildare and Meath, was approved by the meeting and was signed by all the members present.

> "We, the undersigned medical practitioners, hereby bind ourselves by any action involving the resignation of our offices, or any other course which may be deemed necessary to be adopted by the Irish Medical Committee, as representing the Irish medical profession, towards securing satisfactory conditions of medical service in Ireland."

Medical Officers and Political Activity.

In several instances in the last year the Minister for Local Government refused to give his sanction to the appointment as dispensary medical officers of medical men supposed to have been associated with the military activities of the Republican party. It would appear that the Government no longer finds it necessary to take such action. In the case of Dr. Tubridy, of Connemara, whose appointment the Minister refused to sanction some months ago, sanction has now been given. In conveying this decision the Minister remarks: "The Minister is far from desirous of extracting humiliating undertakings from participants in the Irregular operations, although he does not minimise their disastrous consequences. Many of those who participated were misguided, and found themselves committed deliberately without adequate opportunity of considering their position. It appears that the Board of Health are assured from personal knowledge that in the case of Dr. Tubridy no guarantees are necessary from him as to future conformity. In all the circumstances, and in deference to the wishes of the Board of Health, the Minister will not further withhold his sanction to the appointment. In coming to this decision he has taken into account that Dr. Tubridy is a fluent Irish speaker, and that the district concerned is largely composed of native Irish speakers. He has also been favourably impressed by reports of his medical staff as to the devoted service rendered by Dr. Tubridy during former epidemics of fever."

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Wagner-Jauregg Treatment of General Paralysis of the Insane.

THE treatment of general paralysis by injecting the plasmodium of malaria, as devised by Prof. Wagner-Jauregg, of Vienna, has been tried in Germany also. In a report from the Clinic for Psychical Diseases which appeared in a recent issue of the *Zeitschrift für Psychiatrie*, Dr. Jossmann states that the method was tried in 100 cases of general paralysis. After an injection of 2 c.cm. of malarial blood, malaria developed in the patients under treatment in the form of quotidian fever, but was stopped after 12 attacks by the administration of quinine. As a rule, the patients passed through the fever without severe injury to their health; in several cases with cardiac weakness, however, the outcome was fatal. All stages of paralysis were treated by the method, and the result was that in 21 cases the patients were enabled to begin working again, although slight traces of paralysis were still present. In 28 cases the patients were able to resume work to a limited extent, the paralytic symptoms having undergone a considerable amelioration. In 39 cases no improvement worth mentioning was noticeable, and 12 cases died during or in consequence of the treatment. Even in the improved cases slight disturbances of speech and irregularity of the pupils remained. The intellect did not entirely return to normal, and a lack of insight into the state of illness remained. Dr. Jossmann comes to the conclusion that, although it is still too soon for a final judgment to be passed, it has nevertheless been ascertained that during the 18 months in which the Wagner-Jauregg method has been available, improvement has taken place in about 50 per cent. of the cases, especially in the early stages of the disease.

Prophylaxis in Goitre.

As in other mountain districts, goitre is endemic in Upper Bavaria, and similar prophylactic measures to those taken by the Swiss Government to combat this disease have been adopted. They consist principally in the use of iodine-salt for household purposes, which is sold everywhere instead of the ordinary kitchen salt. The salt, termed in Bavaria "Vollsalz," contains 0·5 g. iodine to each 100 kg. of salt, so that an adult person, taking on an average 20 g. of salt a day, receives about 0·07 g. of iodine, a quantity which is quite harmless. Dr. Eggenberger, surgeon to the cantonal hospital of Herisau, Appenzell, Switzerland, addressing the Munich Medical Society, gave a report on the results obtained by the use of iodine-salt. He stated that since the introduction of "Vollsalz" the annual number of operations for goitre in the hospital of Herisau had decreased from 40 to 11. Goitre in school-children had been reduced; infants whose mothers consumed "Vollsalz" did not show hyperplasia of the thyroid gland, a condition which formerly was present in about 50 per cent. of new-born children. He expressed the hope that by a permanent use of "Vollsalz" the incidence of goitre would be reduced to nil within ten years.

New Regulations for the State Examination in Medicine.

The existing regulations for the State examination in medicine have been modified, although its main scope has not been altered. For financial reasons it has not been possible to make the time of study longer than five years, in spite of the enormous pressure on the students' time involved by the lectures and clinical training in the different branches of the medical curriculum. The first two student years are devoted to chemistry, physics, botany, zoology, anatomy, and physiology, and after that time the preliminary examination in those branches is set. The following three years are given up to the theoretical and practical study of clinical medicine. The regulations provide new compulsory additional lectures on hygiene, orthopædics, and forensic medicine. The State examination will include 14 sections—namely, pathology and post-mortem examination. topographical anatomy, pharmacy, internal medicine, surgery, obstetrics and women's diseases, ophthalmology, diseases of the ears, the pharynx, and the nose, children's diseases, diseases of the skin, venereal diseases, psychiatry, hygiene, and forensic medicine. If a candidate fails in passing the examination at the first attempt, he may re-enter for it only once. The practical year subsequent to the State examination has been retained under the regulations; during the practical year the candidate must prove that he is able to give a professional opinion in forensic cases.

The Anti-Opium Law.

The German Parliament has recently passed a Bill dealing with the import, the export, and the sale of opium in accordance with the international conventions on that subject. According to the provisions of the Bill, raw and refined opium (morphine, heroin, &c.) may only be imported by chemical works and wholesale dealers who do not sell their products to the individual consumer; this special licence may be granted only to persons of good conduct and to recognised scientific institutions. From a medical point of view the principal feature of the law is that medical prescriptions containing opium may not be given back to patients, but are to be retained in the pharmacy; they must be produced on request of the district medical officer of health. In this way it will become difficult, if not impossible, for people who indulge in the morphia habit to procure morphine in several pharmacies by one single written prescription. The export of opium to foreign countries is permitted only when the Government in question has given its agreement, and this agreement is produced to the competent German authority. The import and export of opium for smoking purposes is strictly prohibited in accordance with the international conventions: offenders against this and the other provisions of the law may be punished with imprisonment not exceeding three years, and a fine.

The Society for Sports.

At the inaugural meeting of the newly founded Society for Sports (vide THE LANCET, July 5th, 1924, p. 40) which I mentioned in a recent letter, Prof. Schmidt, of Bonn, was elected chairman. The first address was read by Prof. Bier, who gave a historical review of sports, in which he referred to the high esteem in which the ancient Greeks and Romans held sports as factors in producing a healthy and strong youth. Sports in which the skin is freely exposed are a good prophylactic against diseases due to chill, against tuberculosis and rickets. In all forms of sport records are of less importance than good average results. Prof. Klapp spoke in favour of a daily hour of gymnastics in the schools, as is the rule in Sweden. Dr. Bruns, of Königsberg, read a paper on the influence of sports on the size of the heart. Prof. Strassmann spoke on the effect of sports on women, and said that in physically trained women delivery was as a rule more easy than in others. At the climacteric participation in sports counteracted obesity. The society elected a committee to examine the question of over-exertion.

Control of Tuberculous Patients.

According to the statistical tables published by the Statistical Office of the city of Berlin, 36,335 new cases of tuberculosis were examined last year in the municipal sanitary offices (Fürsorgestellen), together with 139,015 older cases. 142,503 visits in the homes of the patients have been made. Previous to the recent anti-tuberculosis law, 73 per cent. of the tuberculous patients were under the control of the offices, and it is hoped that under the new law the efficacy of the Fürsorgestellen will increase. They have worked and will continue to work together with the workmen's insurance institutions, being for the greater part connected with the municipal hospitals.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Politics and University Appointments.

IN this country the University and everything pertaining to it is maintained by the State, and the selection of teachers and the promotion to the title of privat-docent or professor is supposed to depend on scientific considerations only. Consequently, there was some consternation among the public when it became known that for the last three years a number of younger applicants for the posts of privat-docent or extraordinary professor had been rejected without explanation by the University Board. According to the law, the rejected applicant is entitled to learn the reason why he was deemed unfit for the post. This clear postulate of the rules and the law had not been complied with. In three instances, however, the unsuccessful candidates (one an assistant of the Institute for Physical Research, one a linguist, one an eminent student of hygiene) had received proof that they had been rejected simply because they had been suspected of being communists or social democrats. The Social Democratic (Labour) Party in our Parliament has taken the matter up and has lodged a complaint with the Government, demanding "that the rejected applications be reconsidered and that the meeting of the board of professors be controlled by a Government representative, as there can be no violation of the existing laws, which stipulate that no other considerations than the scientific qualifications of the applicant be decisive." At the same time all applicants, mostly medical men, who within the last three years had been unsuccessful are invited to report to the University committee of the Social Democratic Party so as to find out how the rather narrow-minded majority of the old professors had been administering the laws. It is well known that there is a secret tendency to keep out not only modern, free-minded young people, but also Jewish applicants or those of Jewish descent, no matter how well qualified they may be.

Public Baths and their Present Vogue.

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Mr. Howard Eugster, director of the Appenzell Health Department, has publicly regretted the state of affairs in his canton. But Appenzell has an advanced democratic constitution, and to alter the present regulations concerning medical practice a referendum would be necessary, and at present the chances of a favourable issue of such a vote are very small, as "freedom" of medical practice is widely regarded as a democratic achievement; and the unqualified practitioners are firmly entrenched in popular esteem. Moreover, they have begun to organise themselves and to carry on propaganda. That propaganda was not restricted to their own canton. Last year an effort was made to throw open the canton of Glaris, but there the proposition was vetoed by way of the plebiscite. This year it was the turn of the canton of Basle-Land, the population of which was always inclined to this sort of medical treatment. It must be noted that the cantons of Appenzell, Glaris, and Basle-Land alike have no towns and the population is purely rural. The new compulsory additional lectures on hygiene, orthopædics, and forensic medicine. The State examination will include 14 sections—namely, pathology and post-mortem examination, topographical anatomy, pharmacy, internal medicine, surgery, obstetrics and women's diseases, ophthalmology, diseases of the ears, the pharynx, and the nose, children's diseases, diseases of the skin, venereal diseases, psychiatry, hygiene, and forensic medicine. If a candidate fails in passing the examination at the first attempt, he may re-enter for it only once. The practical year subsequent to the State examination has been retained under the regulations; during the practical year the candidate must prove that he is able to give a professional opinion in forensic cases.

The Anti-Opium Law.

The German Parliament has recently passed a Bill dealing with the import, the export, and the sale of opium in accordance with the international conventions on that subject. According to the provisions of the Bill, raw and refined opium (morphine, heroin, &c.) may only be imported by chemical works and wholesale dealers who do not sell their products to the individual consumer; this special licence may be granted only to persons of good conduct and to recognised scientific institutions. From a medical point of view the principal feature of the law is that medical prescriptions containing opium may not be given back to patients, but are to be retained in the pharmacy; they must be produced on request of the district medical officer of health. In this way it will become difficult, if not impossible, for people who indulge in the morphia habit to procure morphine in several pharmacies by one single written prescription. The export of opium to foreign countries is permitted only when the Government in question has given its agreement, and this agreement is produced to the competent German authority. The import and export of opium for smoking purposes is strictly prohibited in accordance with the international conventions: offenders against this and the other provisions of the law may be punished with imprisonment not exceeding three years, and a fine.

The Society for Sports.

At the inaugural meeting of the newly founded Society for Sports (vide THE LANCET, July 5th, 1924, p. 40) which I mentioned in a recent letter, Prof. Schmidt, of Bonn, was elected chairman. The first address was read by Prof. Bier, who gave a historical review of sports, in which he referred to the high esteem in which the ancient Greeks and Romans held sports as factors in producing a healthy and strong youth. Sports in which the skin is freely exposed are a good prophylactic against diseases due to chill, against tuberculosis and rickets. In all forms of sport records are of less importance than good average results. Prof. Klapp spoke in favour of a daily hour of gymnastics in the schools, as is the rule in Sweden. Dr. Bruns, of Königsberg, read a paper on the influence of sports on the size of the heart. Prof. Strassmann spoke on the effect of sports on women, and said that in physically trained women delivery was as a rule more easy than in others. At the climacteric participation in sports counteracted obesity. The society elected a committee to examine the question of over-exertion.

Control of Tuberculous Patients.

According to the statistical tables published by the Statistical Office of the city of Berlin, 36,335 new cases of tuberculosis were examined last year in the municipal sanitary offices (Fürsorgestellen), together with 139,015 older cases. 142,503 visits in the homes of the patients have been made. Previous to the recent anti-tuberculosis law, 73 per cent. of the tuberculous patients were under the control of the offices, and it is hoped that under the new law the efficacy of the Fürsorgestellen will increase. They have worked and will continue to work together with the workmen's insurance institutions, being for the greater part connected with the municipal hospitals.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Politics and University Appointments.

IN this country the University and everything pertaining to it is maintained by the State, and the selection of teachers and the promotion to the title of privat-docent or professor is supposed to depend on scientific considerations only. Consequently, there was some consternation among the public when it became known that for the last three years a number of younger applicants for the posts of privat-docent or extraordinary professor had been rejected without explanation by the University Board. According to the law, the rejected applicant is entitled to learn the reason why he was deemed unfit for the post. This clear postulate of the rules and the law had not been complied with. In three instances, however, the unsuccessful candidates (one an assistant of the Institute for Physical Research, one a linguist, one an eminent student of hygiene) had received proof that they had been rejected simply because they had been suspected of being communists or social democrats. The Social Democratic (Labour) Party in our Parliament has taken the matter up and has lodged a complaint with the Government, demanding "that the rejected applications be reconsidered and that the meeting of the board of professors be controlled by a Government representative, as there can be no violation of the existing laws, which stipulate that no other considerations than the scientific qualifications of the applicant be decisive." At the same time all applicants, mostly medical men, who within the last three years had been unsuccessful are invited to report to the University committee of the Social Democratic Party so as to find out how the rather narrow-minded majority of the old professors had been administering the laws. It is well known that there is a secret tendency to keep out not only modern, free-minded young people, but also Jewish applicants or those of Jewish descent, no matter how well qualified they may be.

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The Basle plebiscite of August 17th has been widely discussed. It is best explained as a natural, however ill-directed, reaction against State interference with individual freedom. The determined resistance against compulsory vaccination is explained by the same tendency. In addition, there is undoubtedly a certain popular mistrust of medical science and of the medical profession. In the canton of Zurich exists a strong movement for abolition of vivisection. The electorate will soon be called to give its verdict on this question.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

The Framingham Demonstration.

After seven years of intensive work the organisers of the Framingham Demonstration have withdrawn. Nearly all of their work for the public health will be taken over by private or official agencies in the locality. The local board of health has in these years increased its expenditure from $8000 to $20,000 per annum, and, we may be sure, is not dissatisfied with the investment. The death-rate for the last two years is 9 per cent. below that for the decennial period preceding the demonstration. This is largely accounted for by a drop of 40 per cent. in infant mortality and 68 per cent. in tuberculosis. Seven "control" towns, whose mortality was comparable to and corrected on the same basis as that of Framingham, showed in the same period a reduction of only 32 per cent. in the tuberculosis mortality. Some account of how these fine results were accomplished has already appeared in your columns,[1] and a great deal of additional material, including valuable statistics, will be found in the final summary report which has just been issued and which may be obtained through the National Tuberculosis Association.[2] The care with which the different phases of the experiment have been classified and the addition of a good index will make this report a particularly valuable handbook to speakers on public health.

Scarlet Fever Prevention.

The health authorities are losing no time in turning to practical account the newer knowledge of the ætiology and immunology of scarlet fever. The New York City Department of Health announces in its weekly bulletin that it is prepared to immunise with Dochez's serum all children who have been exposed to infection with scarlet fever. Throat cultures for scarlet fever streptococci are being taken and the Dick skin test made. The Ohio Department of Health is considering the advisability of combining a Dick test campaign with its present State-wide campaign of Schick testing. It is less than two months since the Drs. Dick pointed out at the annual convention of the American Medical Association that "since scarlet fever toxin can be properly standardised only by means of skin tests on a large number of human beings, it is almost certain that improperly standardised toxin will appear on the market." While I am not aware of the method by which this difficulty has been overcome, it is evident that some means must have been discovered.

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[1] The Lancet, June 14th, 1924, p. 1243.

[2] 370, Seventh Avenue, New York City.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

The following table gives some of the principal health statistics of four counties for 1923:—

Name of county.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Surrey	740,800	16·0	9·7	0·7	1·4	1·4	26	45	2·7
Wiltshire ..	290,880	18·3	11·0	0·8	1·5	1·4	32	51	2·4
Warwickshire	351,800	19·7	10·3	0·8	1·1	1·6	33	60	2·9
Northamptonshire	214,331	17·1	11·5	0·9	1·4	1·6	31	61	5·7

Surrey.

Dr. Joseph Cates describes the consideration given by the county council to the scheme for making more adequate provision for the institutional treatment of tuberculosis. The difficulties arising from the present arrangements are that most of the beds available are outside the county, and cause a natural reluctance in patients and their friends to accept treatment at a distant locality. The public health committee now recommend the carrying out of their original scheme for the erection of a sanatorium at Milford on the site purchased before the war. The proposed sanatorium will have accommodation for 200 patients and the expenditure is not to exceed £80,000. For the treatment of venereal diseases the county council provide clinics at the County Hospital, Guildford, and the Royal Hospital, Richmond, and also share in the joint agreement for using the London hospitals. Referring to midwifery practice by handy-women, Dr. Cates says this illegal practice would have ceased long ago but for the fact that certain medical practitioners knowingly render handy-women assistance by notifying births, signing certificates, and generally by shouldering the responsibility for the disasters which occur from time to time. As regards housing, Dr. Cates says there is no evidence that the overcrowding which existed in Surrey in the year 1922 has appreciably diminished. Reference is made to the large number of foods to which preservatives are now added, and the county analyst draws attention to the increasing practice of adding "improvers" to flour. The principal effect of the use of an "improver" is to enable more loaves to be made from a sack of flour, or in other words, to enable the baker to bake a flour containing a higher proportion of water. Only one producer has been licensed by the county council for "Grade A" milk, though it is clear that the standard required is attainable by any farmer who produces his milk under proper hygienic conditions. Dr. Cates thinks it is a question if the time has not come to consider whether the sale of milk falling below the standard of "Grade A" should any longer be permitted.

An appendix gives an interesting report of the condition of the River Wandle from its source near Croydon to its outfall into the Thames at Wandsworth. The upper part of the river receives a good deal of surface water polluted with oil and tar, and it is stated that since the pollution with oil and tar the water-cress beds adjoining the river do not flourish. Originally the Wandle was noted for its trout, but experiments by riparian owners in recent years to stock parts of the river with fish have failed, presumably owing to the tar, oil, and chemicals discharged into the river. The banks of the river are not well kept in all cases and the flow of the stream is sometimes much impaired. In the neighbourhood of Wimbledon the river is grossly polluted with sewage, chiefly from the works of the Wandle Valley Joint Sewage Board. Dr. Cates recommends that steps be taken for the establishment of a Wandle River Board and that a meeting of all the local sanitary authorities of the districts through which the river flows be called to discuss this proposal. Pending the establishment of such a board he recommends the county council to take proceedings to prevent gross contamination of the Wandle.

In the school report Dr. Cates describes the negotiations which have taken place with the Board of Education to make the dental scheme as complete as possible. The present school dental staff consists of four whole-time and one part-time dental surgeon, who are capable of dealing with 17,000 inspections and 4000 treatments per annum. Each age-group consists of about 7000 children, and one dentist is equal to dealing with half an age-group. It is obvious that many more dentists will be required to deal with the 62,000 children on the register. Dr. Cates discusses a complete scheme for mentally abnormal school-children. The essential unit, he says, is the residential colony, which would receive idiots, imbeciles, low-grade feeble-minded children, and also high-grade feeble-minded children who do not make substantial progress at the day special school. The larger public elementary schools should each have classes for dull and backward children. Those who made no progress in such classes would be transferred to a special day-school. One colony might serve the whole county and three special day-schools in areas such as Mitcham, Barnes, and Woking might be sufficient.

Wiltshire.

Dr. Claude E. Tangye shows that certified midwives attended about 63 per cent. of the confinements in the county and sent for medical aid in about 20 per cent. of their cases. He mentions the curious fact that there are usually fewer cases of puerperal fever in the practice of the bona-fide midwives than in the practice of the trained midwives. Thus in 1923 there were no cases of puerperal fever in connexion with the 824 confinements attended by bona-fide midwives, while there were six cases among the 2600 confinements attended by trained midwives and three cases among the 1999 confinements attended by doctors. The county council make payments to some 70 district nursing associations and to six certified midwives. The subsidised midwives provide for areas otherwise unserved, and the rest of such areas have their needs met by the county council paying the travelling expenses of neighbouring midwives or by the admission of cases to the subsidised maternity homes. The maternity beds subsidised by the county council are at the Malmesbury Cottage Hospital, Salisbury General Infirmary, and the homes at Corsham and Swindon. Dr. Tangye shows that a reconsideration of the hospital areas and the isolation hospital accommodation in the county is necessary both for the sake of economy and efficiency. As the result of a public inquiry the county council was, in November, constituted the authority for dealing with small-pox within the county. The Salisbury Small-pox Hospital is to be acquired by the county council to serve the south of the county and a new hospital is to be built at Ogbourne to serve the north. Dr. Tangye mentions that, as in previous years, very little has been done in some districts in the inspection of houses or in obtaining repairs of dilapidated property. Only 481 new houses in all were erected during the year as against 899 in 1922.

Warwickshire.

Dr. A. Hamilton Wood records the praiseworthy efforts of the county council to prevent river pollution. A survey of the Tame made in July, 1923, showed that the oxygen content of the river was so low that fish life was impossible throughout its entire course. The Tame is a seriously polluted river before it reaches the county boundary, and notwithstanding the beneficial effect of the junction with the Anker, it leaves Warwickshire to re-enter the county of Stafford still polluted. The effluent from the Birmingham, Tame and Rea drainage works was of fair quality during the year, but its chlorinous odour was objectionable to those living on the banks of the river. There were indications of a slight improvement in the water. A survey of the Anker showed serious pollution from the brook which receives the effluent from the Hinckley sewage works. Improvements are being introduced at the Nuneaton sewage works, and other works whose effluents discharge into the Anker. Efforts are also being made to deal with the trade waste from the Sketchley dye works. The Avon enters the county near Rugby as a comparatively small stream and is soon polluted by the Rugby sewage works, which are now being improved. At Coventry the river with a normal flow of less than 10,000,000 gallons receives 5,000,000 gallons of unsatisfactory effluent from the sewage works, and Dr. Wood hopes the Coventry authorities will realise their responsibilities in the matter. An improvement is expected when the bio-aeration plant in course of construction is in operation, probably during the autumn of the present year. The Warwick sewage farm also turns an unsatisfactory effluent into the Avon, and it is imperative, says Dr. Wood, that the borough council should immediately take steps to bring about an improvement.

The widespread epidemics of paratyphoid fever which occurred during the summer centred around Leamington Spa. The source of infection was supposed to be a carrier, whose removal from the district coincided with the cessation of the epidemic. Mention is made of a letter from the Ministry in December suggesting coöperation between after-care committees, the Ministry of Pensions, the King's Roll Committee, and the Ministry of Labour in the endeavour to find suitable employment for ex-sanatorium patients. It is recommended that when possible six weeks' notice should be given of the pending discharge of a patient and that the tuberculosis officer should notify the local employment exchange when a change of occupation is necessary and at the same time forward a list of occupations which are considered unsuitable for the patient. Antenatal clinics have been established by the county council at Warwick and Rugby in connexion with their maternity homes and there are also small clinics at Stoke Heath and Solihull. The attendance of new cases during the year numbered 121, so that this work is only beginning. Dr. Wood points out that the health visitors were reduced in number from 18 to 16 in 1921 and that their work is suffering in consequence.

Northamptonshire.

Dr. Charles E. Paget reports that with the object of a better coördination of health services a special committee of the British Medical Association has been appointed to act as a liaison committee between the county council and the practitioners of the county. The arrangement by which the district nurses of the Northamptonshire District Nursing Association undertake the health visiting in the Brackley area is to be continued for a further period, but such services are to be subject to the supervision of the officers of the county council dating from June 1st, 1923. The county council coöperated with the Insurance Committee in the effective keeping of Health Week, and special celebrations were carried out in the selected centres of Irthlingborough, Oundle, Rothwell, and Rushden. Dr. Paget points out that the increase in cancer among females synchronised with the grave anxieties experienced under home conditions during the war and in the years following, and that there was no marked general increase in the male mortality from cancer until after the conclusion of the war. There was a small outbreak of five cases [illegible] ente fever in one house in the Brackley ru traceable to a sewage polluted well wl to have been infected by an unsuspected carrier staying in the house. There was no need for anyone to use the well for drinking purposes as a public supply of pure water was available for the occupants of the house.

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Lt.-Col. N. J. C. Rutherford, from R.A.M.C., to be Col., vice Col. C. B. Martin, to ret. pay.

The King has been pleased to give and grant unto Dr. Charles Todd, Technical Expert to the Egyptian Department of Public Health, His Majesty's Royal licence and authority to wear the Insignia of the Second Class of the Order of the Nile, which decoration has been conferred upon him by the King of Egypt in recognition of valuable services rendered by him.

Correspondence.

"Audi alteram partem."

CARDIAC DISEASE AND WORK.

To the Editor of THE LANCET.

SIR,—In the out-patient practice of a hospital, and also to a less extent in private practice, the main question in regard to heart disease for a patient who is not bedridden is the finding of a suitable occupation. Thirty years ago, when a student, I was impressed mainly with the importance of rest in heart disease, and the help afforded by digitalis in cases of cardiac breakdown. Medical opinion would now seem to have moved to the opposite extreme, and to be mainly impressed by the importance of exercise in heart disease. True, indeed, as far back as 1890 Oertel had suggested the advisability of mild hill-climbing in cases of heart disease, which was followed later by the exploitation of the Nauheim baths and remedial exercises. It is now generally realised that hearts may be underworked as well as overworked. As a rule, the term disease seems to imply something which is progressive; now there are numerous cardiac affections which, though the result of disease, would be better regarded as disabilities, just as a man who has had infantile paralysis suffers from a disability which is the result of a disease, but can no longer be regarded as having a disease.

In considering the question of work, the problem is how, after all acute conditions have subsided and all probability of a cardiac breakdown averted, with the minimum amount of departure from his ordinary activities, a patient with disease of the heart can make the best of himself. Without definitely trying, it is not easy to say what occupations are fitting and what are not for a patient with cardiac disease, so extremely individual is the lesion. There are, however, certain general principles which may be usefully observed in guiding a patient with cardiac disease to the right occupation. Needless to say, a man, wherever it is possible, should continue at the work to which he is accustomed, for even though the work may be comparatively heavy, he will by long use and wont have acquired the knack of economising his energy so that for him the work may be admissible.

There are, doubtless, certain conditions of work which are unfavourable to most cases of cardiac disease.

1. All occupations involving sudden jerks or spurts and periodical rushes—soldiers, sailors, dock labourers, stokers, &c.

2. Occupations which require frequent stair-climbing or running errands.

3. Prolonged standing such as is required by salesmen.

4. Occupations which involve frequently moving from hot to cold rooms and vice versa—this is particularly unfavourable for such patients as are liable to attacks of angina.

5. Conditions which require work to be done in an overheated atmosphere, such as tobacco drying, or working in large scale cucumber frames.

6. Occupations requiring much use of the arms. Often patients with cardiac disease can walk for considerable distances and indulge in other such forms of exertion with impunity, while anything which requires quite a slight use of the arms, such as dressing or carrying a light bag, may be prejudicial to them. The case of a music teacher came before me, who could do her teaching quite satisfactorily, but a small amount of actual playing herself soon exhausted her.

7. Outside work, as a rule, is much heavier than work indoors, and though it may have some advantages, one must remember that the benefits of the air are often counterbalanced by the changes of temperature and the dangers of getting wet, for those who have rheumatic tendencies and are susceptible to colds and bronchitis.

8. Some occupations are more likely to induce psychic disturbances than others, and these should be particularly avoided by cardiac patients.

It might seem from the above as though there would not be many occupations open to patients with heart disease, and, no doubt, for the absolutely unskilled manual labourer the outlook is an unfavourable one; on the other hand, the tendency nowadays is for work to become less and less entirely unskilled. Apart from the numerous forms of work which come under the head of "clerical," the following occupations are fairly suitable for most forms of cardiac disease.

1. Tailoring.
2. Some forms of bootmaking.
3. Basket-making.
4. Leather work.
5. Telephone operating.
6. Piano factories, "assembling small parts."
7. Fountain-pen factories.
8. Painting.*

* As this often necessitates going up ladders it will not be suitable for cases with aortic disease who are liable to fainting attacks.

In all occupations one of the most important things to consider is the regularity of the hours as well as the actual amount of work to be done, also whether the man has to travel far to his work, involving hurry to catch train, tram, or 'bus. In any given case when selecting an occupation for a patient with cardiac disease, we should carefully consider the cause of the cardiac lesion, for, if it is a valvular lesion, the result of some rheumatic affection, though there is a risk of a recurrent attack and possible further damage to the heart, yet, on the whole, such cases can often do fairly hard work, whereas when the cardiac condition is the result of myocardial degeneration, the amount of work which can be obtained from such cases is much more moderate. As yet we are hardly in a position to interpret the degree of heart weakness in terms of industrial effort.

I am, Sir, yours faithfully,

Montagu-square, W., August 28th, 1924. R. O. MOON.

"ON THE BREAST": AN EXPLANATION.

To the Editor of THE LANCET.

SIR,—The kindly criticism which appeared in your paper on my book "On the Breast" on August 9th contains a statement which perhaps calls for an explanation on my part. Your critic says: "The statement in the preface, however, that no book on the breast has appeared for 20 years is not wholly correct, for a monograph of about the same extent as the present one was published last year and was reviewed in THE LANCET of Oct. 6th, 1923."

He has overlooked another part of my statement which contains the explanation of this seeming inaccuracy; the context is as follows: "It is more than 20 years since the last book on the subject was published in this country by Marmaduke Sheild, and the notice of his death only appeared in the papers when the MS. had already gone to the press. His book remains a mine of information and a monument to his memory." This statement was true when it was written. Marmaduke Sheild died August 4th, 1922, and his obituary notice appeared in THE LANCET on August 19th, and was still fresh in my memory when writing the preface, which thus dates itself to a much earlier period than the appearance of my book.

Unforeseen difficulties in connexion with turning all the illustrations into line drawings delayed the production of the work for more than a year. This accounts for my apparent discourtesy and lack of reference to the excellent monograph of Mr. Willmott Evans, which I am only too glad to have this opportunity of acknowledging, and apologising to him for my seeming rudeness. It is the more necessary to do so as I think your statement has inspired a similar one in the *University College Hospital Magazine.* Here the writer evidently thinks that the second edition of Sampson Handley's work on "Cancer of the Breast" has been referred to and overlooked, but this deals only with cancer of the breast, and is not a book dealing with its general diseases.

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DUNCAN C. L. FITZWILLIAMS.

Grosvenor-street, W., August 22nd, 1924.

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careful treatment, they also apply it to cases with quite extensive disease. It is in this latter type that, in our experience, adhesions are so commonly found, and interfere with or entirely prevent collapse of the affected portion of lung.

In the small number of cases under the care of Dr. Clive Riviere to whom this treatment was applied, all had considerable disease of one lung and sufficient in the other to preclude complete collapse of the more affected lung. In these cases adhesions caused considerable difficulty, and we should be interested to know in what percentage of Barlow and Kramer's cases the same complications occurred. We cannot agree with them that there is little or no general disturbance during treatment, as nearly all our cases showed febrile reactions, a point to which we have referred in a paper on Artificial Pneumothorax, to be published shortly.

The X ray photos of these cases are not always easy to interpret owing to the fact that if the pocket of air is confined to the anterior surface of the lung, at no place on the skiagram is there an absence of lung detail indicating the presence of a pneumothorax. The X ray photos of Dr. Wingfield's cases, though not very convincing at first sight, are more intelligible if this point is borne in mind, and would, no doubt, be quite conclusive if stereoscopic pictures had been taken.

We are, Sir, yours faithfully,
F. BEDO HOBBS, M.B., M.R.C.P., D.P.H.
A. I. G. MCLAUGHLIN, M.B., Ch.M.

August 21st, 1924.

IS LYMPHATIC OBSTRUCTION A FACTOR IN SPRUE?

To the Editor of THE LANCET.

SIR,—Recently two cases have come under my care which may possibly throw some light upon the pathology of sprue, a disease the pathology of which is still obscure. In both these cases laparotomy was performed for chronic appendicitis, and it was observed that there were certain changes in the small intestine and the lacteals. Dr. P. H. Manson-Bahr, in his interesting article in your issue of June 7th last, calls attention to the importance of post-mortem examinations in the earlier stages of the disease. Such opportunities are of comparatively rare occurrence. In addition, there is the possibility of observation during laparotomy performed for surgical complaints. The following are instances of the latter:—

1. Mrs. H. was operated upon for chronic appendicitis on April 30th, 1924. She gave a history of sprue two years previously, and stated that though better she still had loose stools. At the operation, noticing that the ileum was thinned and of different colour from normal, I pulled down a piece of jejunum and found a very striking condition. All the lacteal vessels stood out in a most remarkable manner, each group of blood-vessels being accompanied by a white knotted cord, which could be traced across the surface of the intestine back into the mesentery for some distance. It gave the appearance of a piece of thick cotton having been inserted along the course of all the vessels with knots tied at regular intervals. This condition was uniform throughout the few coils of intestine which I examined. The intestinal wall was of a dull brownish mottled appearance, darker brown areas merging into areas of a lighter shade. During convalescence the stools were not typical of sprue but loose and pale.

2. Mrs. S. On May 28th, 1924, I had the opportunity of verifying the above observations in a case of definitely active sprue with characteristic stools, operation being performed for chronic appendicitis. I found a very similar condition of the intestine and lacteals. In addition, the mesenteric glands were seen to be swollen. The lacteals on closer examination were found to collapse on pressure with the point of the needle and did not appear to be thickened as far as one could make out. In neither case did I find anything indicative of ulceration of the small intestine. However, with a small appendix incision one's opportunity for a thorough exploration was necessarily restricted.

Never having seen the above-noted appearances before during a considerable experience of abdominal surgery, I cannot think there is any doubt that these are manifestations of sprue. Moreover, a distended condition of the lacteals, as a physiological state, is far from probable after a period of starvation preparatory to operation. Two facts would appear to be possible to infer from a condition of distended lacteals: Firstly, that absorption is taking place from the mucous membrane of the small intestine; and, secondly, that there is a delay in the passage of chyle to the general system. The point arises as to where the delay occurs, and I would suggest the lymphatic glands of the mesentery as the most probable. In the case of Mrs. S., these glands were certainly enlarged. We know positively that the mucous membrane of the small intestine in the final stages of sprue becomes so profoundly changed that its power of absorbing is little or nil. In the period of active disease is the deficiency in absorption accounted for by a defect in the small intestine mucous membrane, obstruction in the lymphatic system, or by both?

Lymphatic obstruction may possibly be the predominant factor. As an hypothesis it is quite conceivable that the continued passage of toxin from the intestine may inflame and finally sclerose the lymph glands of the mesentery, hindering and finally blocking out the lymph passage way.

After all, what other chronic disease have we in the whole sphere of medicine in which large areas, if not the whole, of the small intestine mucous membrane is inflamed, evidenced by the destruction of the intestinal wall seen at autopsies as the most conspicuous lesion? The conception of concurrent changes in the mesenteric glands caused by their efforts to deal with noxious substances derived from the small intestine is quite within the range of possibility, and it should be remembered this may be going on from end to end of the small intestine. The putting out of action of small groups of mesenteric glands is well known in several diseases, but what disease except sprue puts such a heavy strain on the mesenteric glands as a whole?

Whatever the explanation of the peculiar appearances which I have described, I feel that they are of sufficient importance to record in the hope that surgeons and pathologists will pay particular attention to the lymphatic system when suitable opportunities arise.—I am, Sir, yours faithfully,

I. DAVENPORT JONES, M.D. Lond.,
Lieut.-Col., I.M.S.

Bombay, August 3rd, 1924.

INTOLERANCE TO A DENTURE.

To the Editor of THE LANCET.

SIR,—I have only just seen Dr. H. St. Arnaud Agate's request for advice on this condition in your issue of August 9th. I recently had a similar case under my care, a neurasthenic who had been under treatment in an officers' pensions hospital, where all his teeth had been extracted, presumably because they were carious. He had then been fitted with the lightest and most perfectly fitting dentures I had ever seen. These he had carried about for nearly two years, but he had never been able to wear them for longer than two minutes owing to invariable retching and vomiting. He told me that he had had the dentures in and out as many as a hundred times an hour. I swabbed his mouth thoroughly with a 10 per cent. solution of novocaine, and first fitted the lower denture. He retained this easily, so after 15 minutes I repeated the swabbing and applied the upper denture. He retched two or three times, but aided by a sharp command to "stick it," he succeeded in keeping the complete set in position. He left my room smoking a cigarette after 15 minutes' chatting, went home, had a hearty meal, and has worn the dentures ever since without trouble.

This method ought to succeed in Dr. Agate's case, as apparently the same neurasthenic element predominates as in my case.

I am, Sir, yours faithfully,
W. ARTHUR JACKSON, M.D.

Marple, Cheshire, August 25th, 1924.

THE DIAGNOSIS OF PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—There is an ingenious trick, due I believe originally to the late Prof. S. G. Shattock, for getting a comparative view of the size of red cells which is available to those who are not prepared to face the complications of Dr. A. Pijper's apparatus (THE LANCET, August 23rd, p. 367) or the labour of Dr. C. Price-Jones's exact measurements. The blood film of the patient is made on a slide in the ordinary way, and one of one's own blood on a cover-glass; both are stained and dried and then mounted with balsam in contact with one another. The two layers of red corpuscles are quite distinct from one another, but a small turn of the fine adjustment brings them into view successively so quickly that it is easy to see whether there is any striking difference in size.

I am, Sir, yours faithfully,
A. E. BOYCOTT.
University College Hospital Medical School,
August 26th, 1924.

STAFF PAYMENT AT THE BRITISH DENTISTS' HOSPITAL.

To the Editor of THE LANCET.

SIR,—I wish to thank you for the comprehensive report [1] you have made of the work being done by this hospital. It is, however, misleading to state simply that the dentists act in a purely honorary capacity. The work of the hospital divides into several branches. First, that of a public dental service open to all but those who are able to pay dentists' ordinary fees. For this work the dentists give their services voluntarily, receiving only out-of-pocket expenses for dentures and the like. Secondly, the maternity and child welfare and tuberculosis centres are worked by dentists who are appointed by the hospital under the local medical officer of health and are paid the usual fee per session. Thirdly, the L.C.C. dental clinic at which dentists appointed by the hospital with the approval of the L.C.C. are paid by the hospital at the usual rate.

The remarks of Sir Harry Baldwin at the annual meeting were intended to apply to the hospital work only as carried on by the voluntary staff. Patients pay fees according to their means and these fees go toward the maintenance of the hospital. If they are able to pay above a maximum they are referred to local dentists.

I am, Sir, yours faithfully,
GEORGE THOMSON,
Chairman, Executive Committee.
31, Camden-road, N.W. 1, August 28th, 1924.

THE CLINICAL THERMOMETER AS A CARRIER OF INFECTION.

To the Editor of THE LANCET.

SIR,—I was interested to read Major H. C. Brown's letter on this subject. It has always seemed to me that the clinical thermometer, if insufficiently sterilised, is a very active carrier of infection. In hospitals I have seen it conveyed from the mouth of one patient to that of another after a few minutes immersion in a solution of about 1 in 60 of carbolic acid. By this immersion the thermometer was supposed to be sterilised. That such sterilisation is useless goes without saying. I agree that washing with water is also ineffective.

For many years I have always carried my thermometer in a special case. This case is solidly made and has a very long thread on it, so that leakage is impossible. In the case is either methylated spirit or absolute alcohol. After using the thermometer I wash it well and then return it to the case. By adopting this method I believe the chances of carrying infection on the thermometer are very small indeed. I get special 2½ inch thermometers, with a magnifying lens, and the case is 3 inches long only, so that it cannot be called cumbersome. Various instrument makers supply these cases; the one I have, some 12 years old, happens to be stamped with the name of Maw. Doubtless this firm still supplies the same case.

It is not necessary to renew the spirit more than about once a week. I believe the method is thoroughly effective, and is certainly very little trouble. I do not think there is any doubt that hypodermic syringes can be kept sterile in a case containing absolute alcohol; I do not see why the same method should not be as efficacious with thermometers.

I am, Sir, yours faithfully,
A. GRAHAM-STEWART, M.B., Ch.B.
Margate, August 22nd, 1924.

SELECTIVE COLLAPSE IN ARTIFICIAL PNEUMOTHORAX.

To the Editor of THE LANCET.

SIR,—Dr. R. C. Wingfield's letter, under this title, in your issue of August 16th bears witness to the important practical results which may follow from recognition of the principle expressed in the words "if small quantities of air are introduced into a free pleural cavity containing a lung only partially infiltrated with tuberculosis, the air so introduced will tend to collect over or round the diseased areas only, collapsing these, and leaving the rest of the lung expanded and capable of function."

He gives the credit for demonstrating this selective localisation of the air in the pleura to the American workers, Barlow and Kramer.[1] As a matter of fact, Dr. Parry Morgan, working in this laboratory during 1911–13, was the first (so far as I am aware) to show that such a localisation must occur, since the presence of a relatively inelastic tuberculous focus in the lung creates a condition of increased tension along an axis passing from the root of the lung, through the focus, to the chest wall. In his paper on the Possibility of Achieving by Partial Pneumothorax the Advantages of Complete Pneumothorax[2] Dr. Parry Morgan stated this view very clearly; he also described an experiment which served to demonstrate that such a localisation did actually occur, and went on to advocate the induction of partial pneumothorax, if necessary on both sides of the chest simultaneously.

Unfortunately the outbreak of war interfered with the continuance of his work and the reporting of cases treated on these lines, but a brief reference to the latter will be found in the *Quarterly Journal of Medicine* for 1917, vol. ii., p. 1.

I am, Sir, yours faithfully,
LEONARD COLEBROOK.
Inoculation Department, St. Mary's Hospital,
Paddington, W., August 22nd, 1924.

To the Editor of THE LANCET.

SIR,—Dr. Wingfield states that no great interest has been aroused by the report of Nathan Barlow and David Kramer, published in the *American Review of Tuberculosis* (April, 1922), regarding selective collapse in artificial pneumothorax. We entirely agree with him that this modification of artificial pneumothorax treatment opens up great possibilities and certainly requires fuller investigation. At the City of London Hospital for Diseases of the Heart and Lungs a few cases have been treated on the lines that Barlow and Kramer suggest, not, however, with quite the same degree of success as they would seem to indicate. In addition to recommending this form of treatment for incipient and early cases which are making no progress in spite of next English physiologist to receive it was Bayliss. The award was the testimony of the scientific world of its appreciation of the sterling work of some 40 years which culminated as regards its outward and visible signs in the publication of the "Principles of General Physiology." It was by the "Principles" that the world which was not lucky enough to be in personal contact with him learned that he was really a great man. Since the first publication of "Foster's Text-Book" there had been no outstanding book in English till the "Principles" came and showed us what Bayliss thought physiology was about; both books stand out because they are impressed with the personality of the authors and they are valued because of that personal character, as well as for the learning that they represent. The biologist may complain that much that might reasonably be called general physiology finds no place in its pages. But the author is less concerned with the characteristics of life than with the mechanisms through which they are manifested; his object, as he says, is to discuss the physical and clinical processes which intervene in the phenomena of life. But this is because it is only to these processes that it is possible to apply the experimental method with profit, and whatever the book includes and whatever it omits, as a matter of experience one finds it in use by physiologists, pathologists, zoologists, botanists, and even chemists, who dig in it, and will continue to dig in it, fruitfully for the sake of the Bayliss which they find there.

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[1] THE LANCET, August 16th, p. 333.

[1] American Review of Tuberculosis, April, 1922.

[2] THE LANCET, 1913, ii., 18.

Sir E. Sharpey Schafer writes:—

"I have known Bayliss intimately for more than 40 years, his early research on vaso-dilator nerves and the one, with Rose Bradford, on the electromotive changes in the salivary glands having been conducted in the old physiological laboratory at University College in the 'eighties. From the very first his experiments were characterised by the care with which they were thought out and the accuracy with which they were performed. His apparatus was never elaborate, but, with Faraday, he knew how to obtain important results by simple means. The single desire to arrive at the truth, without any idea of personal achievement, has furnished the keynote of his career. Not only is his work remarkable for the number and variety of its contributions to physiological knowledge, but still more for the breadth of view which marks its exposition. This feature eventually culminated in his monumental work on "General Physiology," which, more than any other publication in any language, has contributed towards laying a sure foundation of physiology in all its modern developments; every branch of the subject—histology, physics, chemistry, and most of all physical chemistry—having been called upon to contribute its quota.

"Regarding his personal characteristics it is impossible to speak too warmly. The cheerfulness and geniality of his disposition endeared him to his friends; and since these comprise most of his physiological colleagues in all parts of the world, it is certain that no presence will be more missed at future gatherings of physiologists than that of Sir William Bayliss."

Bayliss was knighted in 1922. He received honours also from many foreign academies and from universities and learned societies at home and became an honorary Fellow of his old college, Wadham. He could write after his name M.A., D.Sc. Oxf., hon. LL.D. Aberd. and St. And., hon. Sc.D. Dub. He was chairman and member of numerous committees, treasurer of the Physiological Society, and in 1923 accepted the post of editor of *Physiological Abstracts*. But from first to last he was a student. He escaped the administrative entanglements of the modern university professor and gave himself whole-heartedly to the pursuit of knowledge; he proved all things and held fast that which was good. At any rate for elementary students he was an indifferent expositor and it was not very easy to get him to interest himself seriously in anything but his own problems—which is apt to be a characteristic of the investigators who find things out. But all who were in contact with him knew that there came from him something more than a charming friendliness and sympathy and an amazing wealth of knowledge—something by way of ideal inspiration and point of view which represents university teaching at its highest.

He married in 1893 Gertrude Starling, sister of his friend and fellow worker, and had three sons and one daughter.

WILLIAM AUGUSTUS MAYBURY,

M.D., M.CH. R.U.I.

THE recent death at his residence, West Stockwell-street, Colchester, of Dr. William Augustus Maybury, aged 77, second son of the late William Augustus Maybury, surgeon, of Frimley, Surrey, removes one of the best known of Colchester's medical practitioners. Possessed of remarkable vitality for his age, he retained his faculties and interest in affairs to the end. Dr. Maybury held a record which must be unique for a local doctor. He was in practice in the borough for half a century, was churchwarden of St. Martin's for nearly that period, was the borough police surgeon for over 40 years, and held an appointment as medical officer in the Colchester Union from 1876 until ten days before his death. Educated at the City of London School, he started his medical career at St. Thomas's, qualifying as M.R.C.S. Eng. in 1870 and as L.S.A. in the following year. In 1871 he also graduated M.D. at the Queen's University, Ireland. His first appointment was as house surgeon to St. Thomas's Hospital, followed by the post of resident medical officer to the Newark Hospital. Dr. Maybury will be remembered by many for his cheerful and kindly disposition. As a witness in his capacity of police surgeon he was one of the most precise and painstaking of doctors. His evidence, which always carried weight, was scarcely ever called into question.

Thomas Sydney Short, M.D. Lond., D.P H. Camb., senior physician to the General Hospital, Birmingham, died recently from a seizure at Claverdon, Warwick, while on holiday.

THE LATE DR. E. S. PATTISON.—Edward Seton Pattison, M.R.C.S. Eng., L.R.C.P. Edin., who died on August 27th in Charing Cross Hospital, London, at the age of 69, was at one time medical officer of the St. Mark's Training College, Chelsea, and was divisional surgeon to the Metropolitan Police. Dr. Pattison studied medicine at Charing Cross Hospital and qualified in 1879. As a student he acted as surgeon to the British National Aid Society in Bulgaria and Rumania during the Turko-Russian War of 1877–78, and received the Second Class of the Star of Rumania.

THE LATE DR. J. LASCELLES.—John Lascelles, M.B., Ch.B. (Hons.) Belf., who died suddenly of heart failure at his residence at Earlestown, Lancs, on August 16th, was born in 1892 in Downpatrick, Co. Down, Ireland. He received his medical education at Queen's University, Belfast, where he won scholarships in the Second and Third Medical Examinations, and a special exhibition in surgery in the Final Examination. Qualifying in 1917 he joined the R.A.M.C. as Lieutenant, and, after service in East Africa and Constantinople, was promoted Captain. On demobilisation he took up general practice in Earlestown, where he remained until his death. Dr. Lascelles married a daughter of the late Dr. Archibald Wallace of Rochdale in 1921.

DR. E. H. LIPSCOMB.—A tragedy at sea has deprived the medical profession of a well-known member in the person of Dr. Eustace H. Lipscomb. Dr. Lipscomb, with his sister-in-law and his two children, was sailing with a boatman round a harbour off the coast of Brittany, when the boat capsized, with the result that Dr. Lipscomb and his sister-in-law were drowned, the children being fortunately saved by a passing fishing-boat. Dr. Lipscomb, who was 64 years of age, was educated at Norwich Grammar School, Caius College, Cambridge, and Guy's Hospital, and spent most of his professional life at St. Albans. Here he was equally well known as a doctor and in the public life of the city, and served as mayor, a position which had been previously occupied by both his father and his grandfather. The accident occurred on August 26th.

UNIVERSAL ANÆSTHETIC APPARATUS.

To the Editor of THE LANCET.

SIR,—Mr. Langton Hewer is to be congratulated on the comprehensive apparatus he has produced, as described in your issue of August 16th. It is, I am sure, a step in the right direction—i.e., that of producing a universally applicable anæsthetic apparatus. From the block, however, the machine appears unduly complicated, and, as is usually the case, liberally festooned with rubber tubing. It has always seemed unfortunate to me that machines of this sort, which show a fairly high degree of mechanical complication, are not produced with permanent connexions which do not admit of mis-union and do not perish. I also welcome Mr. Hewer's concession to the views of the majority as regards anæsthetic agents, as indicated in para. (4) of his letter.

I am, Sir, yours faithfully,
R. J. CLAUSEN, M.B.

Carlton-hill, N.W., August 25th, 1924.

PLAGUE AND THE TARABAGAN.

To the Editor of THE LANCET.

SIR,—In your annotation entitled An Arraignment of the Bobac (THE LANCET, August 16th, p. 330) I note that you speak of Dr. M. T. Schreiber, whose article was published in 1907, as "an early writer" on the subject of plague and the tarabagan (*Arctomys bobac*). May I point out that Russian medical observers had written on this question many years earlier. In an article published in the *Journal of Tropical Medicine* of February, 1900, I quoted at some length all the information then available upon this question, from Russian and other sources. I there showed that, in the province of Transbaikalia, outbreaks of tarabagan plague had occurred at least as far back as 1881; and that, in Eastern Mongolia, similar outbreaks had recurred almost every year since 1888. I have since recorded, in your columns and elsewhere, many other outbreaks. The most authoritative Russian writers on the subject are Drs. Biélavski and Riéshetnikof, who published a detailed report on their observations in a Russian journal in April, 1895, and Dr. Zabolotny, who gave much highly interesting information on the subject in the discussions in the last International Sanitary Conference (Paris, 1911).

Your statement that "previous observations upon the tarabagan have been made rather by native hunters than by trained medical men," though probably literally true as regards the number of observations, is perhaps a little misleading. Russian observers have most carefully studied the whole matter; have demonstrated, at least 13 years ago, that the disease in the marmot is true plague; that it is caused by the same bacillus as human plague; that it is transmitted from animal to animal and from animal to man by fleas; and that the tarabagan disease was the source and origin of the truly terrifying epidemic of pneumonic plague in Manchuria in 1911.

Dr. Teh's report, on which your annotation is based, would seem only to confirm (save in the matter of transmission by fleas) the conclusions arrived at by Dr. Zabolotny and other Russian observers as far back as 1911.

I am, Sir, yours faithfully,
Ealing, August 18th, 1924. F. G. CLEMOW, M.D.

*** We should regret any slight upon the work done by trained Russian medical observers on the subject of the tarabagan plague. As British Delegate to the Constantinople Board of Health, Dr. Clemow kept us for many years closely in touch with outbreaks of tarabagan plague reported in Russian journals and archives. Reference to the summaries given in our issues of 1905, ii., 1731; 1909, i., 1863; 1911, ii., 786; and 1913, i., 1698, amongst others, will show how nearly Russian observers came to a final conclusion.—ED. L.

Obituary.

SIR WILLIAM MADDOCK BAYLISS, F.R.S.

BY the death of Sir William Bayliss on August 27th there has passed away one of the greatest physiologists of modern times. William Maddock Bayliss was born at Wolverhampton in 1860. He was the only son of Moses Bayliss, an iron manufacturer, and received his education privately as he was of delicate constitution. He first entered his father's business, but not finding the commercial world congenial he decided to take up the study of medicine. He thus became apprenticed to a doctor in the old style and learned dressing and dispensing in the local hospital. In 1881, at the age of 21, he came to London and entered as a student at University College, where he came under the influence of two great biologists, Ray Lankester and Burdon-Sanderson. The following year he obtained the University Scholarship in Zoology and took the degree of B.Sc. He then began the study of physiology under Burdon-Sanderson, and, in 1883, when Burdon-Sanderson was transferred to Oxford, Bayliss continued his studies under Schafer, but he was not destined to advance any further in the medical curriculum. The subject of anatomy proved a dull one to him, and, having failed in this subject in the second M.B. examination, he gave up the idea of a medical qualification and turned his attention to physiology alone. This decision was, no doubt, taken under the profound impression Burdon-Sanderson and his work had made upon the young student, and in October, 1885, Bayliss followed Burdon-Sanderson to Oxford and entered Wadham College. Three years later he took a first class in the final School of Natural Science in Physiology. The circumstances of Bayliss's student life were destined to shape to no small extent his later activities. His experience of medical practice as a doctor's apprentice in Wolverhampton was of value to him later in enabling him to grasp the true value of medical problems and to perceive the practical application of physiology to these problems, and during his studies at Oxford, at an age senior to that of the average undergraduate, he acquired a breadth of outlook in matters philosophical which later distinguished him among his compeers. Having taken his degree, he returned to London and began work again under Schafer at University College. In the early part of 1890 E. H. Starling joined forces with him in the laboratory of University College, and thus was begun a scientific partnership which endured until Bayliss's death. In conjunction with Starling he did pioneer work on the electro-motive phenomena accompanying the heart beat, the arrangement of vaso-motor fibres in the sympathetic, the innervation of the intestine, the action of an extract of intestinal mucosa in stimulating the pancreas to secrete the osmotic pressure of colloids, the reaction of the blood, and a number of other physiological topics.

In 1893 Bayliss published a paper, which has since become classical, on the depressor nerves, and later, between 1901 and 1908, he wrote a series of papers on vasodilator nerves, their origin and mode of action. When in 1899 Starling was appointed to the Jodrell Chair of Physiology at University College in succession to Schafer, Bayliss acted as his assistant, and took an active part in the teaching of the department, finally becoming professor of general physiology in 1912. From 1904 onwards he produced a long series of papers in the *Journal of Physiology* and elsewhere, and his monograph on the nature of enzyme action, published in 1908, has since gone through four editions. In 1914 appeared the "Principles of General Physiology," and in 1919 Bayliss received the Copley Medal of the Royal Society. The Copley Medal is awarded to the living author of such philosophical research as may appear to be deserving of that honour. It was given to Stephen Hales, the curate of Teddington, who first measured blood pressure, in 1739, and the

North Walsham War Memorial Cottage Hospital.—On August 27th the cottage hospital raised by the town and district of North Walsham as a memorial to the 179 men from the locality who fell in the late war was opened by Her Highness Princess Marie Louise. The total sum subscribed to build, equip, and endow the memorial amounted to £8700, and the hospital was opened practically free from debt. Sir Hamilton Ballance, hon. consulting surgeon to the new institution, referred at the opening ceremony to the need of an X ray installation for minor work in every cottage hospital, and hoped it would not be long before North Walsham had the necessary apparatus.

Bolingbroke Hospital, Wandsworth Common, S.W.—The sum of £10,000 has been given to this hospital by Sir James and Lady Carmichael, of Kingston Hill Place, Kingston, towards the cost of erecting the William Shepherd memorial wing. The cost of this wing, when fully equipped, will amount to £60,000.

Appointments.

Dickson, W. M., M.B. Ch.B., F.R.C.S. Eng., has been appointed Surgeon to Out-patients, Willesden General Hospital.

Hart, E. R., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Hertford District of the County of Hertford.

Neilson, J. P., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Llansawel District of the County of Carmarthen.

Tuohy, P. G., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Uckfield District of the County of Sussex.

Westminster Hospital Medical School: **Wilson, J. G.**, M.B., B.S., M.R.C.S., L.R.C.P., D.P.H. R.C.P.S. Eng., House Physician and Resident Medical Officer: **Coles, B. A.**, B.Sc. Wales, M.R.C.S., L.R.C.P., Resident Obstetric Assistant; **Williams, D.**, M.R.C.S., L.R.C.P., **Harris, I.**, M.R.C.S., L.R.C.P., House Physicians: **Poole, E. B.** M.R.C.S., L.R.C.P., **Bennion, E. R.**, **Zimmerman, M.**, M.R.C.S., L.R.C.P., House Surgeons; **Davies, M.**, M.R.C.S., L.R.C.P., Assistant House Physician: **Davies, J.**, M.R.C.S., L.R.C.P., Assistant House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary and Children's Hospital.—Hon. M.O. for Electro-Therapeutic Dept.

Barnsley County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £600.

Birmingham General Dispensary.—M.O. £550.

Bootle Borough Hospital.—Sen. M.O., also two Jun. M.O.'s. £150 and £125 respectively.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £150.

Carshalton, Queen Mary's Hospital for Children.—Asst. M.O. £500.

Chester Royal Infirmary.—Asst. H.S. £150.

Coventry and Warwickshire Hospital.—Vacancy on Hon. Surg. Staff.

Dover, Royal Victoria Hospital.—H.S. £180.

Exeter, Royal Devon and Exeter Hospital.—H.P. £150.

Gloucestershire Royal Infirmary, Gloucester.—Asst. P. and Pathologist.

Halifax Royal Infirmary.—Third H.S. £150.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Maidstone, West Kent General Hospital.—Two H.S.'s. Each £220.

Manchester Education Committee.—Asst. Sch. M.O. £600.

Manchester University.—Asst. Lecturer in Chemical Pathology. £300–£500.

Middlesex Hospital and Medical School, W.—Surg. Reg. £300.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—M.O. for Out-patients. £125.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—H.P.'s and H.S.'s. Each £50.

Northampton County Mental Hospital, Berrywood.—Jun. Asst. M.O. £350.

Northampton General Hospital.—Hon. P.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.

Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P. Each £150. Also Jun. H.S. and H.P. Each £110.

Royal Free Hospital, Gray's Inn-road, W.C.—Med. Reg.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S.'s. Each £150.

Royal Naval Medical Service.—Surg. Lieuts. 25s. per day.

Royal Northern Hospital, Holloway, N.—H.S. £75.

St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.

Salford Union Infirmary, Hope, Pendleton, near Manchester.—Third Asst. Res. M.O. £275.

Scarborough Hospital and Dispensary.—H.S. £150.

Sheffield Royal Hospital.—Res. Surg. O. £200.

Sheffield Royal Infirmary.—Res. Surg. O. £200.

Sunderland Royal Infirmary.—Two H.S.'s. Each £140.

West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each £100.

Worksop Union Workhouse, &c.—M.O. £230.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments at Cwmbran, Monmouth, and Eyam, Derby.

The Secretary of State for the Home Department gives notice that, in consequence of the resignation of Dr. Clement Dukes, one of the Medical Referees under the Workmen's Compensation Act, 1906, for the Districts of the Rugby and Daventry County Courts (Circuit No. 23), a fresh appointment has to be made. Applications should be addressed to the Private Secretary, Home Office, and should reach him not later than Sept. 20th, 1924.

Births, Marriages, and Deaths.

BIRTHS.

Allen.—On August 27th, at a nursing home, Highgate, the wife of Francis Allen, M.B., of a son.

Hitchings.—On August 26th, at Westfield, Hawkhurst, Kent, the wife of Dr. D. B. Hitchings, of a son.

Murphy.—On August 26th, at "Stonefield," Kidbrook-grove, Blackheath, the wife of Denis V. Murphy, M.B., of a daughter.

Rope.—On August 20th, the wife of Dr. A. D. Rope, of Quarry-place, Shrewsbury, of a son.

Thomas.—On August 28th, at Clapham, London, to Dorothy (Dorothy S. Chamberlain, M.B., B.S. Lond.), wife of Cyril J. Thomas, M.R.C.S., L.R.C.P., of the County Mental Hospital, Lancaster—a son.

MARRIAGES.

Burton—Freir.—On August 28th, at Pinchbeck Parish Church, by special licence, Wilfred Robert Burton, L.R.C.P.I. and L.M., L.R.C.S.I., to Ethel, daughter of Mr. and Mrs. S. Freir, of Yew Tree House, Sharpe's Bridge, Spalding.

Campbell—Chrimes.—On August 28th, at Nevin, Carnarvonshire, John Maurice Hardman Campbell, O.B.E., M.D., of Oxford, to Ethel Mary, second daughter of Captain Chrimes, C.B.E., and Mrs. Chrimes, of Gresford.

DEATHS.

Bayliss.—On August 27th, at St. Cuthberts, Hampstead Heath, Sir William Maddock Bayliss, M.A., D.Sc., F.R.S., Professor of General Physiology at University College, London, aged 64.

Dempster.—On August 28th, William Thomas Dempster, M.B.E., M.R.C.S. Eng., L.R.C.P. Lond., of Brighton-road, Croydon.

Gamble.—On August 23rd, at Glen Maize, Donnybrook, Natal, Leonard Dobbin Gamble, M.B., C.M. Edin., late of Abergavenny, Mon.

Lipscomb.—On August 25th, at Trégastel, Brittany, the result of a boating accident, Eustace Henry Lipscomb, M.B., B.C. Cantab., J.P., of Holywell Hill, St. Albans, Herts, aged 64.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

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Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—As the result of recent examinations the following candidates passed in the undermentioned subjects :—

Surgery.—M. Bannounah, Guy's Hosp.; E. H. Boodrie, St. Mary's Hosp.; J. Crawford, Royal Free Hosp.; F. M. Deighton, Univ. Coll. Hosp.; C. S. Forrest, Manchester and Middlesex Hosp.; J. W. Graham, Manchester; J. C. C. Langford, Manchester and St. Bart.'s Hosp.; Z. Roodyn, Middlesex Hosp.; and C. W. Warne, Guy's Hosp.

Medicine.—F. M. Deighton, Univ. Coll. Hosp.; J. W. Graham, Manchester; G. L. W. Iredale, Edinburgh and St. Mary's Hosp.; W. R. S. Jaecques, Ghent: A. J. Moody and H. Morris (Sect. II.), St. Bart.'s Hosp.; W. E. Pennington, Liverpool; Z. Roodyn, Middlesex Hosp.; and J. G. E. Vachell, St. George's Hosp.

Forensic Medicine.—H. L. Bernstein, Guy's Hosp.; A. K. A. Carter and F. M. Deighton, Univ. Coll. Hosp.; R. C. Glover, Leeds; J. W. Graham, Manchester; A. J. Moody, St. Bart.'s Hosp.; W. E. Pennington, Liverpool; B. A. Perott, Petrograd; M. Schwartzman, Odessa; and Z. Roodyn, Middlesex Hosp.

Midwifery.—W. Bentley, Birmingham; F. M. Deighton, Univ. Coll. Hosp.; J. W. Graham, Manchester; J. C. C. Langford, Manchester and St. Bart.'s Hosp.; E. J. P. McDowell, St. Thomas's Hosp.; W. E. Pennington, Liverpool: and Z. Roodyn, Middlesex Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: J. Crawford, F. M. Deighton, J. W. Graham, G. L. W. Iredale, J. C. C. Langford, H. Morris, Z. Roodyn, and J. G. E. Vachell.

DIPLOMA OF LARYNGOLOGY AND OTOLOGY OF THE CONJOINT COLLEGES.—In the article upon Special Diplomas in the Students' Number of THE LANCET, published last week, there was an omission to mention the special Diploma in Laryngology and Otology granted by the English Conjoint Board (D.L.O.). This Diploma was instituted in 1923, and the conditions for obtaining it follow the accepted pattern. Candidates must possess a registrable qualification, and will be examined in the anatomy, physiology, medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea, bronchi, and œsophagus. The examination takes place twice yearly, and notice of entry, with fee of £6 6s., should be sent 14 days previously to the Secretary, Examination Hall, Queen-square, London, W.C. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Sept. 8th a three weeks' course in ophthalmology commences at the Royal Westminster Ophthalmic Hospital. Clinical instruction will be given every afternoon from 2 o'clock and special demonstrations three times a week on methods of examination, fundus class, and common affections of the eye. A fortnight's course has been arranged at the Infants Hospital from Sept. 15th to 27th. The syllabus deals with diseases of infants from various aspects and consists of clinical demonstrations, "round table" consultations, lectures, &c. Three visits of inspection are to be made: To St. Margaret's Hospital for Ophthalmia Neonatorum, Thavies Inn (Holborn), and the Nursery Training School (Golders Green). A fortnight's intensive course in medicine, surgery, and the various special departments will be held at the Westminster Hospital from Sept. 22nd to Oct. 4th, of which further particulars will be shortly published. Dr. Porter Phillips and Dr. Thomas Beaton will give a series of lecture-demonstrations on Tuesdays and Saturdays, at 11 A.M., in psychological medicine at the Bethlem Royal Hospital from Sept. 30th to Oct. 25th. Courses arranged for October are: Diseases of children, diseases of the ear, nose, and throat, electrotherapy, tropical medicine, urology, and a fortnight's intensive in medicine and surgery and other departments. Full particulars can be obtained from the Secretary of the Association, 1, Wimpole-street, W. 1.

UNIVERSITY COLLEGE HOSPITAL, LONDON.—The annual dinner of the past and present students of University College Hospital will be held at the Hotel Cecil on Friday, Oct. 3rd, at 7.30 P.M. Dr. Michael Foster, O.B.E., will be in the chair. Tickets can be obtained from the secretaries, Mr. Gwynne Williams and Prof. T. R. Elliott, University College Hospital Medical School.

DONATIONS AND BEQUESTS.—By will the late Mr. Richard Stanley Varley, after certain minor bequests, left the residue of his property, about £20,000, to his brother Gilbert with the request, but without creating any trust in the matter, that if circumstances hereafter should permit, there should be paid £2000 to Magdalen College, Oxford, for the Alec Varley Fund, and the balance of the residue to the Vice-Chancellor of the University of Oxford, for the advancement of science, and in particular for medical research.

CUMBERLAND INFIRMARY, CARLISLE.—A gift of £1500 has been received by this infirmary from Mr. P. H. Holt, High Sheriff of Cumberland, for the purpose of establishing a pathological laboratory at the institution. At a recent quarterly meeting of the governors Dr. N. Maclaren said that the need for such a laboratory had been felt by the staff for a long time, and its provision would mark a new era in the life and utility of the Cumberland Infirmary.

KING EDWARD'S HOSPITAL FUND FOR LONDON: KING'S COLLEGE HOSPITAL.—In accordance with the decision of the Fund to apply the legacies of the late Mr. and Mrs. John Wells, estimated at over £200,000, to extensions, improvements, and other special needs of hospitals, a grant has been made to enable 14 additional beds for accident cases to be opened at King's College Hospital. The need for additional accommodation for accident cases was emphasised in the report, issued last spring, of a special committee of the Fund.

BRIGHTON AND ROSE DAY.—The allocation has just been made of the proceeds of Alexandra Day in Brighton and district, which amounted to £750. The distribution was as follows:—Royal Sussex County Hospital, £275; Royal Alexandra Hospital for Sick Children and the Sussex Maternity and Women's Hospital, each £73; Brighton and Hove Dispensary, £80; Lady Chichester Hospital and the new Sussex Hospital, each £48; Eye Hospital and Queen's Nurses, each £31 10*s.*; Surgical Aid Society, £22; and the Brighton Dental Hospital and the Clayton and Keymer Nursing Association, each £10.

MANCHESTER ROYAL EYE HOSPITAL.—The annual report for 1923 states that 30,502 out-patients and 2045 in-patients were treated; the average length of stay in the hospital of the in-patients was 19·1 days. The number of accidents treated was 8497, an average of 23·3 per day. The income from all sources was £18,808, and the expenditure £13,035. Amongst the specified returns of cases of diseases under injuries, 7938 are set down to metal "chips." Amongst diseases there were 330 cases of blepharitis, 331 of chalazion, 559 of keratitis, 516 of kerato-iritis, and 219 of leucoma and nebula; 586 of senile cataract and errors of refraction, 1338 of hypermetropia, 1040 presbyopia, 677 myopia, and 3157 cases of astigmatism of varied forms. Of convergent strabismus there were 1324 cases. Twenty-six cases of ophthalmia neonatorum were admitted.

A CONFERENCE ON MEDICINE IN INDUSTRY.—The annual week-end conference of the Institute of Industrial Welfare Workers, to be held at The Hayes, Swanwick, Derbyshire, from Sept. 26th to 29th, has chosen for its subject the Doctor and the Psychologist in Industry. On Saturday afternoon the subjects for discussion will be: What (1) Psychology, (2) Medical Science can do for Industry," the former being introduced by Dr. C. S. Myers, F.R.S., director of the Institute of Industrial Psychology; the second by Dr. W. F. Dearden, hon. secretary of the Association of Certifying Factory Surgeons. In the evening accident prevention will be dealt with from the psychological aspect by Dr. M. Culpin, lecturer on psychotherapy at the London Hospital; from the physiological aspect by Dr. H. M. Vernon, investigator for the Industrial Research Board. Discussions of a more general character will occupy the Sunday. The hostess is a well-known welfare worker, and other leading representatives of the welfare movement will take the chair at the several gatherings. The conference secretary is Miss N. J. Kessler, West Lynn, Altrincham, Cheshire.

CITY AND HOSPITALS' CHARITY ATHLETIC CONTEST.—To-day, Saturday, Sept. 6th, the third annual charity athletic contest between the Banks (holders), Stock Exchange, insurance offices, and hospitals, for the *Financial Times* challenge shield will be held at the Crystal Palace. Apart from the challenge trophy, which is held for a year by the institution scoring the greatest number of points, there are no prizes or awards of any kind. The athletes, who will include members of the British Olympic Games team, national and other champions, compete purely for the honour of representing their respective institutions and for the cause of charity. The programme consists of level flat events at 100, 220, 440, 880 yards, mile, three miles, and 120 yards hurdles, two miles walk, high and long jumps, putting the weight, and mile relay. In order that the entire proceeds may be divided between the London hospitals the *Financial Times* is again paying all expenses of the meeting. Tickets, 1*s.* 6*d.* (including admission to the Palace and covered stands), may be obtained from the hon. secretary, Mr. R. A. Lyons, at St. Bartholomew's Hospital, or from the *Financial Times*, 72, Coleman-street, London, E.C. 2.

NORTH WALSHAM WAR MEMORIAL COTTAGE HOSPITAL.—On August 27th the cottage hospital raised by the town and district of North Walsham as a memorial to the 179 men from the locality who fell in the late war was opened by Her Highness Princess Marie Louise. The total sum subscribed to build, equip, and endow the memorial amounted to £8700, and the hospital was opened practically free from debt. Sir Hamilton Ballance, hon. consulting surgeon to the new institution, referred at the opening ceremony to the need of an X ray installation for minor work in every cottage hospital, and hoped it would not be long before North Walsham had the necessary apparatus.

BOLINGBROKE HOSPITAL, WANDSWORTH COMMON, S.W.—The sum of £10,000 has been given to this hospital by Sir James and Lady Carmichael, of Kingston Hill Place, Kingston, towards the cost of erecting the William Shepherd memorial wing. The cost of this wing, when fully equipped, will amount to £60,000.

Appointments.

DICKSON, W. M., M.B. Ch.B., F.R.C.S. Eng., has been appointed Surgeon to Out-patients, Willesden General Hospital.

HART, E. R., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Hertford District of the County of Hertford.

NEILSON, J. P., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for the Llansawel District of the County of Carmarthen.

TUOHY, P. G., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Uckfield District of the County of Sussex.

Westminster Hospital Medical School: **WILSON, J. G.**, M.B., B.S., M.R.C.S., L.R.C.P., D.P.H. R.C.P.S. Eng., House Physician and Resident Medical Officer; **COLES, B. A.**, B.Sc. Wales, M.R.C.S., L.R.C.P., Resident Obstetric Assistant; **WILLIAMS, D.**, M.R.C.S., L.R.C.P., **HARRIS, I.**, M.R.C.S., L.R.C.P., House Physicians; **POOLE, E. B.** M.R.C.S., L.R.C.P., **ZIMMERMAN, M.**, M.R.C.S., L.R.C.P., **BENNION, F. R.**, M.R.C.S., L.R.C.P., House Surgeons; **DAVIES, M.**, M.R.C.S., L.R.C.P., Assistant House Physician; **DAVIES, J.**, M.R.C.S., L.R.C.P., Assistant House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne, District Infirmary and Children's Hospital.—Hon. M.O. for Electro-Therapeutic Dept.

Barnsley County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £600.

Birmingham General Dispensary.—M.O. £550.

Bootle Borough Hospital.—Sen. M.O., also two Jun. M.O.'s. £150 and £125 respectively.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.

Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £150.

Carshalton, Queen Mary's Hospital for Children.—Asst. M.O. £500.

Chester Royal Infirmary.—Asst. H.S. £150.

Coventry and Warwickshire Hospital.—Vacancy on Hon. Surg. Staff.

Dover, Royal Victoria Hospital.—H.S. £180.

Exeter, Royal Devon and Exeter Hospital.—H.P. £150.

Gloucestershire Royal Infirmary, Gloucester.—Asst. P. and Pathologist.

Halifax Royal Infirmary.—Third H.S. £150.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

Maidstone, West Kent General Hospital.—Two H.S.'s. Each £220.

Manchester Education Committee.—Asst. Sch. M.O. £600.

Manchester University.—Asst. Lecturer in Chemical Pathology. £300–£500.

Middlesex Hospital and Medical School, W.—Surg. Reg. £300.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—M.O. for Out-patients. £125.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—H.P.'s and H.S.'s. Each £50.

Northampton County Mental Hospital, Berrywood.—Jun. Asst. M.O. £350.

Northampton General Hospital.—Hon. P.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.

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Births, Marriages, and Deaths.

BIRTHS.

ALLEN.—On August 27th, at a nursing home, Highgate, the wife of Francis Allen, M.B., of a son.

HITCHINGS.—On August 26th, at Westfield, Hawkhurst, Kent, the wife of Dr. D. B. Hitchings, of a son.

MURPHY.—On August 26th, at "Stonefield," Kidbrook-grove, Blackheath, the wife of Denis V. Murphy, M.B., of a daughter.

ROPE.—On August 20th, the wife of Dr. A. D. Rope, of Quarry-place, Shrewsbury, of a son.

THOMAS.—On August 28th, at Clapham, London, to Dorothy (Dorothy S. Chamberlain, M.B., B.S. Lond.), wife of Cyril J. Thomas, M.R.C.S., L.R.C.P., of the County Mental Hospital, Lancaster—a son.

MARRIAGES.

BURTON—FREIR.—On August 28th, at Pinchbeck Parish Church, by special licence, Wilfred Robert Burton, L.R.C.P.I. and L.M., L.R.C.S.I., to Ethel, daughter of Mr. and Mrs. S. Freir, of Yew Tree House, Sharpe's Bridge, Spalding.

CAMPBELL—CHRIMES.—On August 28th, at Nevin, Carnarvonshire, John Maurice Hardman Campbell, O.B.E., M.D., of Oxford, to Ethel Mary, second daughter of Captain Chrimes, C.B.E., and Mrs. Chrimes, of Gresford.

DEATHS.

BAYLISS.—On August 27th, at St. Cuthberts, Hampstead Heath, Sir William Maddock Bayliss, M.A., D.Sc., F.R.S., Professor of General Physiology at University College, London, aged 64.

DEMPSTER.—On August 28th, William Thomas Dempster, M.B.E., M.R.C.S. Eng., L.R.C.P. Lond., of Brighton-road, Croydon.

GAMBLE.—On August 23rd, at Glen Maize, Donnybrook, Natal, Leonard Dobbin Gamble, M.B., C.M. Edin., late of Abergavenny, Mon.

LIPSCOMB.—On August 25th, at Trégastel, Brittany, the result of a boating accident, Eustace Henry Lipscomb, M.B., B.C. Cantab., J.P., of Holywell Hill, St. Albans, Herts, aged 64.

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Medicine.—F. M. Deighton, Univ. Coll. Hosp.; J. W. Graham, Manchester; G. L. W. Iredale, Edinburgh and St. Mary's Hosp.; W. R. S. Jaecques, Ghent; A. J. Moody and H. Morris (Sect. II.), St. Bart.'s Hosp.; W. E. Pennington, Liverpool; Z. Roodyn, Middlesex Hosp.; and J. G. E. Vachell, St. George's Hosp.

Forensic Medicine.—H. L. Bernstein, Guy's Hosp.; A. K. A. Carter and F. M. Deighton, Univ. Coll. Hosp.; R. C. Glover, Leeds; J. W. Graham, Manchester; A. J. Moody, St. Bart.'s Hosp.; W. E. Pennington, Liverpool; B. A. Perott, Petrograd; M. Schwartzman, Odessa; and Z. Roodyn, Middlesex Hosp.

Midwifery.—W. Bentley, Birmingham; F. M. Deighton, Univ. Coll. Hosp.; J. W. Graham, Manchester; J. C. C. Langford, Manchester and St. Bart.'s Hosp.; E. J. P. McDowell, St. Thomas's Hosp.; W. E. Pennington, Liverpool: and Z. Roodyn, Middlesex Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: J. Crawford, F. M. Deighton, J. W. Graham, G. L. W. Iredale, J. C. C. Langford, H. Morris, Z. Roodyn, and J. G. E. Vachell.

Diploma of Laryngology and Otology of the Conjoint Colleges.—In the article upon Special Diplomas in the Students' Number of The Lancet, published last week, there was an omission to mention the special Diploma in Laryngology and Otology granted by the English Conjoint Board (D.L.O.). This Diploma was instituted in 1923, and the conditions for obtaining it follow the accepted pattern. Candidates must possess a registrable qualification, and will be examined in the anatomy, physiology, medicine, surgery, and pathology of the ear, nose, pharynx, larynx, trachea, bronchi, and œsophagus. The examination takes place twice yearly, and notice of entry, with fee of £6 6*s*., should be sent 14 days previously to the Secretary, Examination Hall, Queen-square, London, W.C. 1.

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King Edward's Hospital Fund for London: King's College Hospital.—In accordance with the decision of the Fund to apply the legacies of the late Mr. and Mrs. John Wells, estimated at over £200,000, to extensions, improvements, and other special needs of hospitals, a grant has been made to enable 14 additional beds for accident cases to be opened at King's College Hospital. The need for additional accommodation for accident cases was emphasised in the report, issued last spring, of a special committee of the Fund.

Brighton and Rose Day.—The allocation has just been made of the proceeds of Alexandra Day in Brighton and district, which amounted to £750. The distribution was as follows:—Royal Sussex County Hospital, £275; Royal Alexandra Hospital for Sick Children and the Sussex Maternity and Women's Hospital, each £73; Brighton and Hove Dispensary, £80; Lady Chichester Hospital and the new Sussex Hospital, each £48; Eye Hospital and Queen's Nurses, each £31 10*s*.; Surgical Aid Society, £22; and the Brighton Dental Hospital and the Clayton and Keymer Nursing Association, each £10.

Manchester Royal Eye Hospital.—The annual report for 1923 states that 30,502 out-patients and 2046 in-patients were treated; the average length of stay in the hospital of the in-patients was 19·1 days. The number of accidents treated was 8497, an average of 23·3 per day. The income from all sources was £18,808, and the expenditure £13,035. Amongst the specified returns of cases of disease under injuries, 7938 are set down to metal "chips." Amongst diseases there were 330 cases of blepharitis, 331 of chalazion, 559 of keratitis, 516 of kerato-iritis, and 219 of leucoma and nebula; 586 of senile cataract and errors of refraction, 1338 of hypermetropia, 1040 presbyopia, 677 myopia, and 3157 cases of astigmatism of varied forms. Of convergent strabismus there were 1324 cases. Twenty-six cases of ophthalmia neonatorum were admitted.

A Conference on Medicine in Industry.—The annual week-end conference of the Institute of Industrial Welfare Workers, to be held at The Hayes, Swanwick, Derbyshire, from Sept. 26th to 29th, has chosen for its subject the Doctor and the Psychologist in Industry. On Saturday afternoon the subjects for discussion will be: What (1) Psychology, (2) Medical Science can do for Industry," the former being introduced by Dr. C. S. Myers, F.R.S., director of the Institute of Industrial Psychology; the second by Dr. W. F. Dearden, hon. secretary of the Association of Certifying Factory Surgeons. In the evening accident prevention will be dealt with from the psychological aspect by Dr. M. Culpin, lecturer on psychotherapy at the London Hospital; from the physiological aspect by Dr. H. M. Vernon, investigator for the Industrial Research Board. Discussions of a more general character will occupy the Sunday. The hostess is a well-known welfare worker, and other leading representatives of the welfare movement will take the chair at the several gatherings. The conference secretary is Miss N. J. Kessler, West Lynn, Altrincham, Cheshire.

City and Hospitals' Charity Athletic Contest.—To-day, Saturday, Sept. 6th, the third annual charity athletic contest between the Banks (holders), Stock Exchange, insurance offices, and hospitals, for the *Financial Times* challenge shield will be held at the Crystal Palace. Apart from the challenge trophy, which is held for a year by the institution scoring the greatest number of points, there are no prizes or awards of any kind. The athletes, who will include members of the British Olympic Games team, national and other champions, compete purely for the honour of representing their respective institutions and for the cause of charity. The programme consists of level flat events at 100, 220, 440, 880 yards, mile, three miles, and 120 yards hurdles, two miles walk, high and long jumps, putting the weight, and mile relay. In order that the entire proceeds may be divided between the London hospitals the *Financial Times* is again paying all expenses of the meeting. Tickets, 1*s*. 6*d*. (including admission to the Palace and covered stands), may be obtained from the hon. secretary, Mr. R. A. Lyons, at St. Bartholomew's Hospital, or from the *Financial Times*, 72, Coleman-street, London, E.C. 2.

Notes, Comments, and Abstracts.

RED CROSS WORK.

IN the able hands of its late Chief Executive Officer the Red Cross was becoming more and more associated with the reorganisation of hospitals throughout the country. On the death of Sir Napier Burnet, the Joint Council appointed Dr. F. N. K. Menzies as Director of the Department of Hospital Medical Services, and a report from him, including special articles of general interest to hospital workers, will be issued in the autumn. The present report[1] deals with the other work of the Joint Council. Although we are now six years from the armistice the Joint Council is still assisting many officers and ex-officers suffering from pulmonary and other forms of tuberculosis. These cases unfortunately show no signs of decreasing, and relapse is all too frequent. The Auxiliary Hospitals for Officers Department refunds hospital stoppages to necessitous pensioned and half-pay officers in sanatoriums, hospitals, and nursing homes, and so relieves them of anxiety for the welfare of their dependents. Since comparatively few patients are fit to start work immediately on discharge, it is customary to make a small weekly grant for extra diet and an additional grant for maintenance. The Department also helps ex-officers with the expenses of sanatorium treatment while their cases are under consideration by the Ministry of Pensions or the Officers' Appeal Tribunal, and, in cases pronounced ineligible but deserving and necessitous, the patient is given the chance of a reasonable period of sanatorium treatment. During the winter 1923–24 the Department made travelling arrangements for and gave *financial assistance to a number of lung cases sent out to* Switzerland and the Riviera by the Ministry of Pensions, the destination being Sunny Bank, San Remo (19 cases), Sanatorium Davos-Dorf (14), Palace Hotel, Montana (12), Sanatorium Altein, Arosa (10), Clinique Quisisana, Leysin (4), Chateau Mer et Mont, Mentone (4), and other places in smaller number. Emergency help was given on a large scale in the form of maintenance grants to the families of tuberculous ex-Service men while awaiting admission to the sanatorium, during their stay, and for a reasonable time after. Borough Emergency Help Committees are now represented on local tuberculosis care committees and overlapping is thus avoided.

The Home Service Ambulance Committee aims at bringing suitable means of transport within reasonable reach of the sick and injured in all parts of the country, and there are now 333 home service ambulance cars working in England, Wales, and Ireland. Without such cars, as the report pointedly states, much of the benefit of recent scientific discovery would be inapplicable to patients who are at any distance from a hospital. The Committee aims not merely at distributing ambulances but establishing an ambulance service attended by men and women with proper qualifications, and it is becoming the normal practice for members of the Order of St. John or British Red Cross Society to accompany the ambulance at every call. Home service ambulances are also available for various public duties; for the use of factories as required by the Home Office, to provide means for removal of serious cases of sickness and injury; and for the coal-mines, where men working in the pits drive and attend the ambulances during their rest periods. Home service ambulances are attending more and more at football matches, race meetings, and other crowded gatherings where casualties may occur amongst spectators. During a recent omnibus and tram strike they undertook the conveyance of out-patients to various hospitals in London. The recent conference on ambulances recommended local authorities to pay a mileage fee for ambulances sent for by the metropolitan police, and the War Office has recently recommended the various commands to use the service for the transport of military cases to hospital when other vehicles are not available. One ambulance has been fitted up as an X ray car, after being used as such on the Italian front and since maintained by the College of Ambulance. With the coöperation of the Institute of Radiology, radiographic diagnosis has thus been rendered available at the patient's home, the apparatus being erected in the bedroom and connected by means of cable to the dynamo attached to the car. Since the ambulance service has been instituted something like a quarter of a million cases have been carried in these ambulances, nearly 50,000 by 11 ambulances in West Lancashire alone, and in other counties the numbers run into thousands. This kind of Red Cross work deserves fuller recognition from the public than it now receives.

A NEW VACCINATION ORDER.

THE Minister of Health has issued a new Vaccination Order for England and Wales, which will come into force on Oct. 1st. Hitherto under the Vaccination Order of 1923 the parent or person registering the birth of a child has been given "Form A," which requires that the child shall be vaccinated, and if the parent has any conscientious objection to the operation, he must apply for an additional form on which to make the statutory declaration. From Oct. 1st, under the new Order (Vaccination Order, 1924), Form A includes a form of declaration of conscientious objection. The effect of the new Order will be to facilitate procedure for the objector.

THE COLLEGE OF AMBULANCE, LTD.: THE CASE OF COLONEL PARKINSON.

THE recent case in connexion with the sale of honours appears to have reflected unfairly upon the College of Ambulance, Ltd., so that our readers ought to be reminded of the facts. Lieut.-Colonel G. W. Parkinson claimed from the College of Ambulance, Ltd., and their secretary, Mr. E. E. Harrison, £3000 on the ground that the money had been paid as a contribution to the funds of the College on the faith of representations by Harrison that in return he could, and would, procure for the plaintiff the honour of knighthood. Under the judge's direction the jury answered questions left to them by the judge as follows:—

1. (*a*) Did Harrison represent that he was in a position to undertake that the plaintiff would receive a knighthood?—Yes. (*b*) Or did he only promise to use his influence for that purpose?—No.
2. (*a*) Was that statement false?—Yes. (*b*) Fraudulent?—Yes.
3. Was the plaintiff induced thereby to part with his £3000?—Yes.
4. Did the plaintiff contract with Harrison personally, looking only to him for securing the knighthood?—No.
5. Did he contract with him in the belief that he was acting for and had the authority of the College in giving the undertaking?—Yes.
6. Was Harrison in fact so authorised, or was he held out by the College as so authorised?—Certainly he was held out as so authorised, and we consider he was so authorised.
7. Did the plaintiff knowingly mislead the council into thinking that he was making a voluntary donation?—No.
8. Damages?—£3000.

A verdict of the jury on the facts having thus been taken, argument took place as to whether any action could be maintained or money recovered upon such a contract as had been revealed. Mr. Justice Lush held that the action must be dismissed, but deprived Harrison of his costs, saying that he had increased the costs of the litigation by denying fraud, and causing the plaintiff to be cross-examined at length, and yet had not gone into the witness-box or called witnesses to meet the charge of fraud. A contract, his Lordship held, to guarantee or undertake that an honour would be conferred by the Sovereign if a contribution were made to a public charity, or some other service rendered, was against public policy, and therefore an unlawful contract to make, and one that could not be sanctioned or recognised by a court of justice. On the question whether the plaintiff could recover the money paid either from Harrison or from the College of Ambulance, he did not lay down that in every case of a contract against public policy, where one of the parties had defrauded the other, the plaintiff would be unable to recover; but that where there was an element of turpitude and the parties were in *pari delictu*, neither could recover against the other. The plaintiff knew that he was entering into an improper contract and he ought not to have made it. The plaintiff was not entitled to recover from the College on the ground that it had benefited through its agent, the illegality of the contract precluding him.

Mr. Justice Lush said that the questions as to whether the College had authorised or held out Harrison as authorised to promise a knighthood in return for £10,000 to the College, had been put by him, subject to doubt in his own mind as to whether there was evidence on which the jury could find that there was such authority. He now held that there was no evidence to justify the findings arrived at, but went on to say that if there had been, it would have made no difference to the result of the action, the contract being in itself illegal. Mr. Justice Lush's pronouncement with regard to the connexion of the College of Ambulance with the undesirable acts of its secretary, must have been eminently satisfactory to those responsible for its management, upon whom the jury's verdict cast what, in the judge's opinion, was an unmerited slur. Any charitable institution may rightly feel satisfaction at seeing rewards in the form of titles bestowed upon its supporters in recognition of their munificence. Those responsible for the finances of hospitals and similar institutions should, however, be agreed that charity must be its own reward in the great majority of cases, and they must be of one mind with the judge in holding that any bargain to secure a recompense such as knighthood for a prospective donor is contrary to public policy. A bare offer to endeavour to procure such recognition is equally undesirable. Any power to procure honours and rewards supposed to be possessed by members of a particular board of management would at once confer upon it an unfair and undeserved advantage over other like bodies, and no doubt some, besides those persons directly interested in the recent litigation, will have noted the unenviable publicity which litigation has involved.

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[1] Fourth Report of the Joint Council of the Order of St. John of Jerusalem in England and the British Red Cross Society, covering the period from April 1st, 1923, to March 31st, 1924.

CONCERNING LEFT-HANDEDNESS AND STAMMERING.

To the Editor of The Lancet.

Sir,—The sinister associations of left-handedness[1] were recognised by the Early Church. The Nestorian Christians of India attribute to the ministrations of St. Thomas, the apostle, their conversion to the faith, and there can be no doubt that Christianity was established on the coastal regions of India at a very early period. The traditions of the Early Church give very curious information as to the strange manner in which the Saint travelled to these parts of the world, and of his work and sufferings in the East, where (as the "Golden Legend" has it) he preached the Gospel to the miscreants. In the apocryphal "Acta Sancti Thomæ," which record his evangelisation among the peoples of India, there is an incident recorded where the Saint persuaded a newly-wedded pair to a life of Christian asceticism; with an account of the arguments he made use of, some of which are distinctly "modern" (shall we say?) in their tone. He told them that if they adopted this course of life they would avoid much trouble both for themselves and for any potential offspring, drawing for their benefit a brief but sufficiently vivid account of the possible undesirable eventualities attendant upon the multiplication of what perhaps he secretly considered to be an undesirable stock.

The descriptions as given in the various languages in hich this story has come down to us are in substantial greement,[2] but the Amharic version introduces an interesting variant in giving left-handedness as one of the stigmata eld out to the young couple as a possible result of their perpetuation of their race. It has been translated by Sir E. A. W. Budge from the collation of two MSS. in the British Museum,[3] and the argument made use of by St. Thomas runs as follows. If his auditors follow his advice, "then will ye escape labour and sufferings, both the seen and the unseen; and ye shall be free from worldly cares, and the children who would form your posterity will not come into being. If ye beget many children ye will, for their sakes, become avaricious oppressors, and ye will afflict the orphan and the widow, and ye will become unjust persecutors. And if ye do all these things, ye will suffer sore chastisement. And the greater number of children become wicked and fall into error, for devils attack them either secretly or openly, or they become mad, or foolish, or deaf, or left-handed, or lame, or paralysed. If they escape these things they become unprofitable evildoers, or workers of abominations, or they become the companions of avaricious men and thieves, and in any case ye suffer labour and sorrow."

This catalogue of *vitia* allied in their incidence to left-handedness is significant: insanity, deafness, paralysis, deformity, criminality, and other forms of anti-social defect. The Greek text[2] gives in addition blindness, dumbness, "half withered"-ness, adultery, murder, and theft. A personal experience of my own may be of interest in this connexion of left-handedness. Twenty years ago or more, during my student days, I was taken with the idea that it would be very excellent if, in surgery, I could use either hand indifferently. With this end in view I practised using the left hand and, amongst other things, taught it to write. It was not long before I could write (as I still can) legibly, though not very quickly, with the left hand; but an immediate effect was that my normal (right-handed) writing suffered marked alteration for the worse, and this deterioration has been permanent.

In the Manchester *Evening Chronicle* for August 20th there is an account of how on that date at the Royton Police Court a domestic servant was bound over after pleading guilty to theft, having broken into her employer's house while he was away on holiday, stolen some money, and gone away leaving the house open. Her employer, who put in a plea of leniency on her behalf, is reported as saying, "Her history was a very sad one. She stammered badly as the result of shock through finding her father hanging when she was a little girl." There is no mention of her being left-handed or anything of that sort, but this correlation of stammering and conveying (as wise men call it) has a certain significance at the present moment.

For those who are interested in the subject of left-handedness there is quaint reading to be found in the fifth chapter (Of the Right and Left Hand) of the fourth book of Sir Thomas Browne's "Pseudodoxia epidemica" (1646).

I am, Sir, yours faithfully,
Sinistré.

August 27th, 1924.

UNSIGHTLY WARTS.

To the Editor of The Lancet.

Sir,—In reply to Dr. G. S. Sander (The Lancet, August 2nd, p. 256), a young woman had a wart so large it resembled a black teat under her chin. By my suggestion she washed it with carbolic soap, also damped it slightly and rubbed the soap against it so as to leave a little about it. It soon disappeared, leaving no trace. I have never seen warts which carbolic soap used in that way would not quickly cure.

I am, Sir, yours faithfully,
M. L. J.

August 26th, 1924.

To the Editor of The Lancet.

Sir,—May I suggest to your correspondent that he try the effect of surgical diathermy on the multiple soft warts which are annoying his patient. One method of application is described by Saberton on p. 105 of his small text-book ("Diathermy in Medical-Surgical Practice." Cassell and Co. 1920). I have modified this method in my own practice, connecting the patient directly to the Tesla pole and earthing, as does Saberton, through a pointed probe which I hold in my own hand. This makes the condenser couch superfluous. The spark gaps on the diathermy machine are at first closed down as far as possible until the wart is partially anæsthetised and a thin layer of desiccated tissue covers the surface. It is then necessary to open the spark gaps and increase the current somewhat in order to desiccate the growth completely. The method is practically painless, usually efficacious in a single sitting, and so far I have not seen any scars.—I am, Sir, yours faithfully,

Rosslyn Earp.

Antioch College, Ohio, U.S.A., August 20th, 1924.

GRATUITOUS MEDICAL ATTENDANCE.

To the Editor of The Lancet.

Sir,—Your issue of August 16th contains a letter signed "Inquirer" and a commentary by yourself which embrace what I have always believed to be the sentiments of the entire profession; at any rate, my own experience has been that no doctor or dentist has ever accepted a fee from me, though I have never failed to press an offer of pecuniary reward for services rendered. That I have been fortunate is evident from the fact that many of my colleagues in the Services, particularly the Navy, have been charged, in some cases quite large sums, for professional services rendered to themselves or their wives, the larger sums being frequently marked "half fees."

Are we to understand that there are amongst our professional brethren those who repudiate that relationship because our practice is confined to our own Services?

I enclose my card, and am, Sir, yours faithfully,
Mars.

August 27th, 1924.

THE HAZEL LUXURY SHOE.

A shoe with a wool-felt lining has the advantage of being comfortable and of keeping the foot dry and warm, but the general use of such shoes has been impeded by the cost of production involved in sewing a felt sole to the boot by hand. Messrs. Crick and Co., boot manufacturers of Northampton, with branches in London and the suburbs, have overcome the difficulty by a patent process of manufacture. In these shoes, which we have tested, the insole of wool-felt is a quarter of an inch thick, and although compressed in walking retains its resiliency. No doubt so absorbent a material is more likely to retain perspiration, an objection which can be met by more frequent change of socks. To those who suffer from cold feet or who need to be careful to keep their feet warm, a shoe of this kind should prove of value.

FOOD VALUE ON LIFEBOATS.

Though the Board of Trade appears to have on its staff no official medical adviser, it has yet made a definite advance in ordering that, to the biscuits and water carried in the boats of merchant ships for use in emergency, there shall be added from July, 1925, one pound of condensed milk for each person the boat is certified to carry. This will raise the proportion of fats and the total caloric value of the food available. The difficulty of distribution may be serious, and that inclines us to regret that a solid ration of chocolate had not been ordered instead. Water is in boats carried in small flat casks, breakers, and is distributed with a tiny enamelled-metal bucket, the diameter of a man's thumb and the length of two. The little bucket is dropped into the breaker through the bung-hole and so filled that none of the precious fluid may be lost in the pouring of it out. Chocolate in bars would keep very well in the biscuit tank, and, marked in ounce or half-ounce lengths, could be easily served out. We hope the officers of the Board of Trade will give further thought to food values when providing for the needs of the shipwrecked.

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[1] W. S. Inman: Squint, Left-handedness, and Stammer, The Lancet, August 2nd, p. 211.

[2] See James, Apocryphal New Testament, 1924, p. 369.

[3] Addendum to Baralam and Yewasef, 1923, vol. ii., pp. 304–5.

PUBLIC HEALTH IN PALESTINE.

A REPORT on the administration of Palestine just presented to Parliament by the Colonial Office contains the following statements with regard to health in the mandated territory. The organisation in the last three years, and the higher standard of professional knowledge inculcated in all sections of its staff by means of regular courses of training, have enabled the Health Department to hold in check the diseases—malaria, enteric fevers, typhus, and small-pox—which in the past ravaged the country. Measles broke out more than once in epidemic form with pneumonic complications, causing heavy mortality among children. Small epidemic units with nurses served some affected areas with good results; about 5000 cases, with a death-rate of 18 per cent., were reported. Measles is, therefore, chiefly responsible for a large increase in the death-rate, which for the first 11 months of 1923 was 25·03 per 1000, as compared with 18·75 per 1000 in 1922. There were restricted outbreaks of plague in the summer at Jaffa (11 cases, one death) and Haifa (four cases, one death). The efficiency of the antimalarial campaign has been maintained; economies in its cost have followed the measures taken to protect cisterns and clear swamps under the Anti-Malarial Ordinance, and with the ready coöperation of the inhabitants, now appreciative of the benefits derived from antimalarial operations. The most notable results have been achieved in the once malaria-ridden Valley of Esdraelon. The menace of the anopheline mosquito has been banished from the large towns, and the established control of culex breeding renders almost unnecessary mosquito nets or the mosquito-proofing of houses. In the attainment of these results the two American units, the Malaria Research Unit and Malaria Survey Section, have given invaluable service. Palestine is also indebted to the workers in, and subscribers to, the voluntary and missionary hospitals, without whose unremitting care and constant help the progress made during the past two years would have been impossible. Improved water supplies in towns and villages, where springs have been guarded from pollution and piped, and stricter supervision of public establishments helped to lessen the incidence of enteric fevers. The occurrence of typhoid and typhus was almost altogether confined to immigrants from Central Europe.

On the closure of the travelling ophthalmic hospital and ancillary clinics special ophthalmic clinics at Government hospitals and dispensaries were formed, and are conducted by medical officers who have taken a course of instruction at an ophthalmic "training centre" in Jerusalem, under the chief surgeon of the British Order of St. John of Jerusalem Ophthalmic Hospital, Jerusalem. The travelling hospital had since August, 1919, treated 14,148 patients; the total attendances were 81,848 and 5378 operations were performed. 18·3 per cent. of its patients were blind in one or both eyes. The medical inspection and treatment of children in Government schools, particularly for eye disease and parasitic and verminous condition of hair and skin, have been attended with success.

At Kantara quarantine control was abolished, and will be exercised in future during the pilgrimage season only, or if extensive epidemics develop in Egypt. As from September, travellers arriving at Samakh and Ras el Nakura by motor-car route from Baghdad were placed under medical surveillance against cholera and small-pox. Ship and passenger inspection at the ports was conducted without interruption. At the end of 1923 there were seven Government general hospitals dieting for 168 patients, and a mental hospital at Bethlehem dieting for 40 patients. The sanitation of villages progressed only where local councils exist. Notification of births and deaths is more regular, and infectious disease, except of the minor type such as measles, is reported more readily under the stimulus of periodical visits by medical officers. Laudable efforts have been made in some towns to improve the primitive drainage systems.

A serious increase of rabies in dogs and jackals, reflected in a greater number of human victims, has demanded an organised campaign. Antirabic vaccine is now prepared and distributed directly by the Health Department. There were 11 cases of hydrophobia, all fatal. Circulars to enlighten the public were published. The number of lepers in Palestine does not now exceed 80; of these 30 are in the Moravian Society's Leper Home, Jerusalem.

The central laboratories of the Health Department, with bacteriological, chemical, and antirabic divisions, are in Jerusalem, and there are clinical laboratories at Jaffa and Nablus; these, with the laboratory of the Malaria Research Unit at Haifa, and the laboratories of the Hadassah Medical Organisation at Jerusalem, Jaffa, Haifa, Tiberias, and Safed, ensure, by close coöperation, rapidity of diagnosis and analysis of specimens throughout the country.

The voluntary hospitals and dispensaries, despite diminished funds, treated 20,000 in-patients in 1923. In regard to the training of nurses, a higher and more uniform standard was reached in examinations than in previous years, in both Government and voluntary hospitals. In the Rothschild Hospital, Jerusalem, more than 40 nurses are undergoing instruction. In the Midwives' Training School of the Government Hospital, Jerusalem, 11 women (as against three in 1922) passed the qualifying examination. Licences to practise were granted to 80 doctors, 39 dentists, 22 pharmacists, and 28 midwives. The medical and dental professions are becoming seriously overcrowded. The wholesale trade in drugs and poisons is more strictly controlled. Special certificates are issued for the import of the dangerous narcotic drugs controlled by the Imperial Opium Convention; the amounts imported in 1923 were: cocaine, 9965; morphine, 710; codeine, 2384; and heroin, 1398 grammes.

A HOME BUBBLY-BATH.

EFFERVESCING baths have been employed for their sedative and tonic action in neurasthenia and certain conditions of cardiac disturbances; at Nauheim they have long been the recognised treatment for cardiac dilatation, and the whirlpool bath introduced at many Red Cross institutions during the war was found of value not only in cases of muscular and articular trouble, but also in systemic affections. The Aerophor Pearl Bath Apparatus (J. Wenger, 65, Hayter-road, London, S.W. 2) is designed to provide at home an effervescing bath so as to avoid the trouble and expense of visiting a spa. Effervescence is produced in one type by an electro-motor to be connected with the electric-light supply, and in other types by a small turbine, compressed air being liberated through minute holes in a grid at the bottom of the bath over which is placed a wooden rack. The aeration is claimed to allow a higher temperature of water to be used, and to result in a tonic quality which the ordinary bath does not possess. The bath is, we understand, in extensive use at hydropathic establishments and holiday resorts in Switzerland, as well as at a number of Swiss hospitals, and medical testimonials from America show its appreciation there in cardiovascular and certain types of neurotic disorder.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 8th, to SATURDAY, Sept. 13th.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Clinical Instruction in the Out-patient Department every afternoon from 2.30 P.M. Venereal Clinic Tuesday and Friday from 5.30 to 7 P.M.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross. Clinical instruction every afternoon from 2 P.M. Wed., 5 P.M., Mr. Giblett: Clinical Demonstration on Common Affections of the Eye. Thurs., 5 P.M., Mr. Morgan: Fundus Class. Fri., 10 A.M., Mr. Hine: Methods of Examination.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street, W. Mon., 5 P.M., Mr. Bathe Rawling: Cerebral Surgery.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 8th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Pernet: Skin Dept. 2 P.M., Dr. Gibb: Eye Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—11 A.M., Mr. Dudley Buxton: Dental Dept. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

An Address

ON

SOME VARIATIONS FROM THE NORMAL TYPES OF HUMAN METABOLISM.

Communicated to a Joint Meeting of the Liverpool Medical Institution and the Manchester Medical Society, Session 1923–24,

BY CHARLES J. MACALISTER, M.D. EDIN., F.R.C.P. LOND.,

LECTURER ON CLINICAL MEDICINE, UNIVERSITY OF LIVERPOOL;
HON. PHYSICIAN, LIVERPOOL ROYAL SOUTHERN HOSPITAL.

AT the meeting of the British Association last year Sir Oliver Lodge, in an inspiring address on Man and the Universe, spoke of the doctrine of the ascent of man as being a hopeful one, because it explained so much. It explained our imperfections. He referred to man as a newcomer in a world whose antiquity is now estimated at 400 million years. "He is unfinished—still in the process of becoming and not complete." Although Sir Oliver Lodge was referring more particularly to defects other than physical there is no doubt that they, whether anatomical or chemical or both, are to be included among those which he said "could be understood and explained as stages in the process of development towards an ideal which lay ahead."

As medical men we are constantly confronted with problems upon which these fundamental truths have a direct bearing. In the process of evolution man has attained to what may be regarded as an average physiological perfection, but we frequently meet with variants from such a standard—some, as far as we know, purely structural, others definitely metabolic or chemical—which indicate that ancestral, or it may be reversionary, characteristics are present. These account for departures from health concerning which our help is often sought, and their study is interesting, not only from an evolutionary standpoint, but also because their origin occasionally throws light upon the most successful measures which may be taken for their correction or alleviation.

Man's present stage of development has probably been acquired through ancestral conditions of environment and opportunity, and these have led to his having structural and physiological complexities which present considerable variations. His habits as to food must have undergone extraordinary alterations, and his capacity for metabolising almost any types of food have surely resulted from great developmental changes in modern as compared with primitive types. The lower animals, so far as I am aware, have fewer of these complexities. They are in the main carnivorous or vegetarian, as the case may be, in their dietetic habits—and man's ancestry included both of these classes. A falling back to prototype may accord to him a lessened capacity for mixed metabolism, and it is this assumption that I go on to discuss.

DIETETIC METABOLIC VARIATIONS THE RESULT OF REVERSIONS.

I would suggest that dietetic variations of metabolism in man result from reversions, sometimes towards a carnivorous, sometimes towards a vegetarian type of ancestry, and if this be so, we must take it that there was a common stock from which these types originated. In the carnivora there was a latent or undeveloped vegetarian metabolism, whereas in the vegetarian primate type there was a latent carnivorous one. This hypothesis explains the possibility of there being an adaptability to new dietetic conditions on the part of primitive man as he emerged from the vegetarian or primate stage. With the development of the carnivorous instincts the latent carnivorous metabolism to which I have referred would become more and more highly developed, and by degrees the organs and secretions necessary for a mixed feeder would become evolved; changes would take place in the encrinoid secretions, and there would be retrogression of other parts whose utility had become lessened in the new circumstances. It is on this account that vestigial remains play such an important part in the problems of metabolism which mainly interest me. In this relation I would recall how the embryo and fœtus in the course of development illustrate many of the types belonging to postnatal conditions of former orders before the birth of the perfected infant man: (1) Protozoal type —unicellular germ-plasm; (2) notochord with gill slits; (3) budding limbs; (4) perfected limbs and well-developed tail of placental mammal with muscles for wagging it which afterwards become ligamentous and fixed; (5) up to sixth month the lanugo reminiscent of a period when hairy covering was essential as a permanent structure in ancestry; (6) in the fœtus 15 mm. long the milk streak containing the anlage of several pairs of breasts, which all disappear in the process of development except the normal permanent pair.

It needs very little stretch of imagination to consider how, by persistence postnatally of one or other of the characters of former ancestries, may be explained some of those permanent anatomical and physiological imperfections which account for idiosyncrasies of metabolism.

ANATOMICAL VARIATIONS IN RELATION TO PERSONAL IDIOSYNCRASIES.

In 1908, in a paper on the "Personal Factor in Diet,"[1] I directed attention to an example of this influence of a developmental arrest in the case of an individual presenting well-marked symmetrical polymastia, who had very limited capacity for metabolising the fleshes. In the years which have intervened many of these cases have come under notice, and an interesting observation in relation to polymastia which I made, when pathologist to the hospital, was the occasional association of a long spiral appendix, sometimes presenting a funicular opening, thus resembling what is normal in the anthropoid apes. Polymastia is sometimes regarded as an evidence of degeneration, and its subjects as possessing mental qualities of a decadent character. My own experiences do not confirm this. I prefer to regard it as resulting from an arrest of development which leaves the individuals with a physiology of a specialised type. Their intelligences and characters have usually been normal. But the important point is that, although they are generally mixed feeders and present in most cases full powers of digesting and utilising vegetable foods, they are truly reversionary so far as their animal protein metabolism is concerned, insomuch that, like the carnivora, their flesh-containing meals require to be taken at much longer intervals than is the case with average normal persons.

I have mentioned this type of case to indicate that there are people who present anatomical variations coincident with and throwing light on their idiosyncrasies. Quite recently a man has presented himself who suffered from severe attacks of indigestion for more than 20 years. There were sometimes considerable intervals of freedom from pain, but when the attacks began they tended to continue for long periods. There were anorexia, splitting headaches, pain and flatulence after food, and marked constipation. On examination a multiple polymastia was found. There was a pair of phantom areolæ in the seventh interspaces and another abdominal pair. It turned out that his dyspepsia was of ingravescent type—that is, it got worse as the day went on; often absent after breakfast, marked after his midday meal, and very severe after the evening one, the discomfort lasting well into the night and disturbing his rest. A further interesting note was the history of pains in his joints which he had ascribed to rheumatism, and he informed me that his father and mother, especially the former, had suffered from arthritic conditions. This type of dyspepsia is not uncommon, apart altogether from any visible evidences of arrested development, and I have little doubt that it depends on deficiencies of secretion and of elimination which bring it into the broad categories of gout. In other words, such dyspepsias result from idiosyncrasies or imperfections of metabolism which are probably reversionary.

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[1] Liverpool Medico-Chirurgical Journal, 1908.

The flesh-eating animal is a slow metaboliser. It lives generally on one meal a day, and in some instances such a meal is sufficient to sustain it for a longer period. The human being who has inherited a dominant carnivorous type of metabolism bears qualities which are reminiscent of what is normal in the pure carnivore. Convention and tradition have taught John Bull that three, often pretty substantial, meat-containing meals are likely to keep him fit. Perhaps most normal people can and do thrive on such a régime, but in those variants whose metabolism and powers of elimination cannot keep pace with the intake of fuel a breakdown occurs sooner or later, and the gouts appear. The inadequate organs are continually in a condition of overstrain owing to absence of metabolic rest-periods; health becomes impaired, and often enough life is shortened.

Perhaps I can best explain these rest-periods by means of diagrams which illustrate how waste products become stored up when idiosyncrasy is not met (Figs. 1 and 2). The remedy for these cases is not far to seek; it simply involves an imitation during the day of what occurs during the night. There are many degrees of this type of inadequacy which could be investigated scientifically by chemical means, but for practical purposes the history of the patient's trouble generally enables one to determine whether more than one flesh-containing meal is advisable. In most cases it suffices to allow a moderate amount of animal protein with breakfast and a fairly substantial dinner in the evening—very little, if any, food, and certainly no flesh, being permitted in the middle of the day.

FIG. 1.

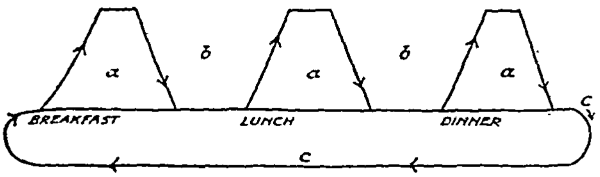

Diagram illustrating the rise and fall of waste products in the blood in the average type of metabolism—three flesh-containing meals a day being taken: (*a*) Metabolic period, (*b*) metabolic rest-period, (*c*) long metabolic rest-period during the night.

FIG. 2.

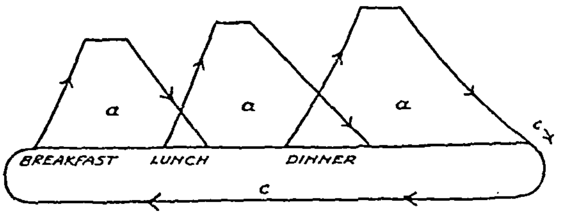

Diagram illustrating a slow metabolism, showing how the line of elimination crosses the line of rise of the waste products associated with successive meals. The diurnal metabolic rest-periods are lost and there is progressive accumulation of waste products in the blood. The nocturnal rest-period is shortened. (*a*) and (*c*) as Fig. 1.

Civilisation has doubtless had much to do with the weakening of those instincts in man which inform the lower animals what is unsuitable in the way of food. The senses of smell, taste, sight, and touch are keen advisers among animals. Human beings, on the other hand, suffer a good deal owing to the depreciation of these guides. Every now and then, however, we come across children in whom the instinct guides remain; children who dislike certain types of food, sometimes animal, sometimes vegetable. We have all come across children who dislike the traditional milk puddings, and become sick when forced to take them, or who do not like meat or fat. They are sometimes brought to us because they are supposed to be ill, the fact being that their natural instincts indicate that they have physiological inadequacies for the metabolism of the types of foods against which their tastes rebel. They are variants from the normal average, reversionaries perhaps towards the carnivorous or vegetarian types, as the case may be. The starch dyspepsias in some cases have this explanation, and how often are they treated by giving those remedies which are likely to aid the digestion of the food element which they require in lesser rather than increased amounts.

I am not dealing now with rare anomalies of metabolism but with those we encounter in our daily work.

INTERSEXUALITY IN ANIMALS.

Of all metabolic problems there are none quite so puzzling as those which seem to depend on sexual aberrations; cases in which males present some degrees of femininity or where females have or come to possess male characteristics. These cases are not uncommon, and they develop at varying periods of life. In the human being they do not attain to the extreme degrees referred to by Goldschmidt in his writings and recent addresses in this country, or by Dr. Crewe's hen which became a cock and, after doing its duty as a layer of eggs and a mother, eventually became the father of a family.

Preponderance of sex does not mean that there may not be present some degrees of intersexuality so far as hormone influences are concerned. It seems perfectly clear that the determination of sex takes place at the time of fertilisation of the ovum—that is, that if the X chromosome of the sperm unites with an X of the germ the offspring is female, whereas a union of chromosome Y male with the X female results in a male; but this does not imply that there may not be subsequent intersexuality due to the inheritance possessed by every individual, whether male or female, of hormones belonging to both sexes. There are dominant hormones belonging to and ruling the sex of the individual, and subdominant (or latent) ones of the opposite sex. The fact that mixed sex phenomena occur has, of course, been recognised for long—we are not unfamiliar with them in our clinical work—but the scientific study of intersexuality and its relation to sex determination has been largely carried out by a school of which Goldschmidt is representative. For my own knowledge of it I am largely indebted to his work as translated by Prof. Dakin,[2] whom I freely quote. It has been shown that in the animal kingdom there are two groups which are distinguishable from one another so far as determination of the sex characters of the individual are concerned.

1. Among the insects (moths, caterpillars, &c.) sex and everything appertaining to it is fixed at the time of fertilisation. Every cell of the body is then determined sexually, and there is no possibility of one part of the body being influenced by another. This has been proved experimentally, both by destruction of the sex organs and also by their transplantation, male to female and vice versa, both in the embryonic state of the insect and later. In neither case has any influence or change been produced in the secondary sex characteristics of the adult. Evidently the sex organs and the bodily structures which characterise the sex are quite independent of one another.

2. In the mammals, birds, &c., on the other hand, the distinctive characters are influenced by the presence of the

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[2] Mechanism and Physiology of Sex Determination by R. Goldschmidt, translated by W. J. Dakin. 1923.

secretion of a ductless gland—i.e., there is a central organ which produces the hormones (and controls others) which are necessary for the completion and maintenance of the sex determination. There are no longer the independent activities of the individual cells throughout the body, but a coördinated and regulated development of sex characteristics, whether male or female, which is brought about by the activity of a secretory centre, situated in the reproductive organs. Castration experiments, such as those made in insects, are therefore very different in their results. In place of no change taking place in the secondary sex characteristics of the individual, the removal of the essential internal secretions brings about a modification or a disappearance of the characters of the sex, whereas, on the other hand, transplantation of the organs of the opposite sex results in the production of the secondary sexual characteristics of that sex.

Intersexuality in the first (insect type) group is therefore zygotic and entirely determined at fertilisation. Intersexuality in group 2 (mammal type) is hormonic and dependent for its development on the influence of internal secretions acting after fertilisation.

Hormonic Intersexuality in Man.

That hormonic intersexuality exists in man there can be no doubt. We know it from the effects of castration after the period of childhood (I shall refer presently to conditions coexistent with the arrest of development of the sexual hormone produced in the child). for it must be understood that intersexuality the result of castration only influences those organs or parts which develop, or are capable of developing, after the operation. The general result is that they approach the female type. The distribution of the pubic hair and the non-development of the beard point in this direction, and also the mammary gland and broad nipples and areolæ may develop. In other words, some degree of intersexuality has existed, and the already present but subdominant female hormones exert their influences upon these parts which have possibilities of differentiation when what would have been the dominant male-producing hormones are removed. We have clinical evidences of the same kind in women also. This relationship of the sex hormones can be best explained by means of a diagram (Fig. 3) on the lines of one in Prof. Dakin's book. The curves represent the hormone factors and I would direct attention to Goldschmidt's statement in relation to them, that a high concentration of one of the two hormones is not alone decisive for the production of pure sexes: a minimum of difference between the two is necessary. The dotted lines are curves of male hormones in different grades of female intersexuality showing how the male hormones may approximate the female ones and finally cross them. At (*a*) the diagram shows how the male line may cross the female one temporarily. This is a very complex subject and has interested me because many years of clinical observation have suggested that not a few disorders depend upon incoördinations of function which are brought about by mixed or approximating sexual metabolism. Some of these begin early in life and some later on: I rather think that in the main they become manifest at one or other of the climacteric periods. I have met with a case of a boy, aged 14, who presented a well-marked secondary anatomical characteristic. He had a unilateral female breast. So far no pathological phenomena have presented themselves, and he is quite boyish in his propensities.

FIG. 3.

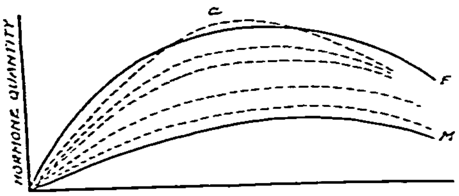

Diagram illustrating the relationship of the male to the female hormonic curve in the case of a female. The dotted lines indicate how the male curve may approximate the female one, or temporarily cross it at (*a*).

Ateleiosis.

The degrees of intersexuality are very variable. There are evidently cases which may be regarded as neutral, or in which the sex dominance is delayed at all events until a late period of life. We have an example of this in that very interesting variety of dwarfism designated ateleiosis (not arriving at perfection) and defined by Dr. Hastings Gilford.[3] It is characterised by conspicuous delay of growth and retardation of development; not necessarily an absolute arrest, because both may simply be very retarded. The subjects of it are not hermaphrodites externally. The sex is determined, but the hormone influences are arrested. For instance, the person may grow very slowly even up to the age of 30 or later, long after the normal period of growth has been passed. The point about these cases is that they are normally proportioned little people who have simply stopped growing at a normal rate during the period of childhood. They are the Peter Pans of real life. They retain the characters of childhood during the years when they should be adolescents or adults, or even until quite old. Sometimes the retardation begins during fœtal life, as in the well-known case of the Sicilian dwarf, who was only 7 inches long when born at the full time, and was 19½ inches tall when she died at 9 years of age. Her sexual organs (ovaries, uterus) and her bladder resembled those of a four months fœtus—i.e., the time when the arrest of her development probably began. Her ossification and dentition were those of a 2 years old child, but her proportions were perfect, and she was not deformed. General Mite, who died at the age of 41, was 31⅜ inches high, and weighed 14½ lb., was another of these antenatal cases. His sex organs remained quite infantile.

Cases of Ateleiosis Beginning Postnatally.

Commoner are those varieties of ateleiosis which begin postnatally. They generally grow normally until the second year or later childhood. I recently showed some of these cases in Liverpool, among them—

> A boy, who developed normally until his fourth year, when he ceased to grow at the normal rate, and is now in his twelfth year developmentally a child of 5. His height is 3 feet 6 inches, weight 3 st. 8 oz. Radiographs of his bones show that the centres of ossification are those of a child of 5 years old. He is bright and intelligent and in the seventh standard at school.

The following case I have had under observation for the longest period.

> A male, aged 40, grew normally until 7 years of age, then very slowly until 10, and after that hardly at all for a number of years. At 14 he stood 3 feet 10 inches, and weighed 3 st. 10 lb. He had then the appearance and development of a properly proportioned boy of 8. He was a bright, clever, and intelligent little boy, and a lady presented him with a toy cart and horse which amused him a good deal. He remained in this childish condition with little augmentation of height, but with childish sex organs and no pubic hair, until 22 years old, when he began to grow (after being dosed with thyroid substance), and he went on growing for three or four years until he measured 4 feet 10 inches at about 30 years of age. During the past 10 years he has gained nearly 2 inches and is now just under 5 feet high. He still has the face and rounded limbs of a young boy, but, strange to say, his sex organs began to develop two or three years ago. He has grown some pubic hair and the rudiments of a beard and moustache which he shaves about once a fortnight, and he has also manifested some virility. He has the female pubic distribution and rather prominent breasts. Evidently the curves of the sex hormones have slowly risen, the male are dominant, the female not far distant: a strange example of growth and development going on into middle life.

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[3] Disorders of Postnatal Growth and Development.

These interesting cases illustrate a neutral type of sex metabolism. Ateleiotics are almost always cheerful and intelligent, and possessed sometimes of a great sense of humour. Their retained childishness is sometimes associated with a liking for the games of the young. It is interesting that they are said never to become bald even if they live to be quite old (there is a case recorded who lived to the age of 98), and certainly my cases just related have fine heads of hair. Cases of well-grown males presenting intersexuality have this same characteristic. Subjects of ateleiosis are much sought after for purposes of shows. In a juvenile troupe which I inspected some time ago the comedian of the party was upwards of 20, although he had the appearance of a little boy. Neutrality of this kind is not so distressing in its result as are those intersexualities which bring about their effects at a later period of life. There are some cases often classed as adolescent neurasthenics or as being hysterical which belong to this category.

I have recently seen a youth, aged 16, tall and effeminate-looking, with cold, blue extremities and rather poor physical development, who has quite definite indications of femininity in his prominent mammary areolæ and follicles, his undeveloped sexual organs, and female distribution of the pubic hair. His thyroid, too, is large and from time to time fluctuates in size. His thymus shadow (X ray) is also large. Here surely the subdominant female hormone curve approximates the dominant male one.

There are certain epileptics of both sexes who possibly come into this same class. Some time ago I saw a man, aged 30, who began taking fits at the period of puberty. They were suggestively periodic, occurring at monthly intervals, and he, too, had these prominent and broad mammary areolæ, little growth of facial hair, and the female pubic distribution was well marked.

The sexual hormones have so well-known an influence on the nervous system that it is not wonderful that psychoses and neuroses should be associated with a clash brought about by their incoördination. Two cases have left an indelible impression on my mind with reference to this.

The first was an adolescent girl who since puberty had developed a degree of melancholia with delusions of fear. She had the usual blue, cold extremities, slow breathing, and general apathy so common in these cases. Menstruation was not in abeyance, but she was always worse at these times, and had on one occasion threatened suicide. This girl had a large growth of downy hair on the sides of her face and on her lips and chin, and a marked triangular male distribution of the pubic hair. Here, again, the curve of the subdominant male in the individual was running high, and had perhaps overtaken the dominant female one, and there can be little doubt that the psychic disturbance was a corollary to this fact.

The other case was a young man of about 23 presenting female attributes. He had a rather soprano voice, no facial hair, the female pubic distribution, and prominent nipples. He had one small testis, the other being undescended, and he presented the nervous temperament and the cold, blue extremities which seem to be associated with incoördination of the sexual hormones.

GASTRIC ULCER AND INTERSEXUALITY.

I have often wondered whether gastric ulcer is in any way related to an intersexuality perhaps with temporary crossings of the female curve by the male one. It is one of those diseases which we rather tend to look upon as an entity, but I think there are reasons for believing that the ulcer is a local manifestation of a constitutional condition. Duodenal ulcer is essentially a male disease; the perforating gastric ulcer attacks the female. Is there any explanation for this? Possibly some light may be thrown upon it by a careful analysis of its symptoms, not those appertaining to the ulcer itself but the ones which lead up to it. It will almost always be found that a considerable change takes place in the constitution of the patient. Sometimes this change occurs at or about the climacteric period of adolescence, but at all times it is reminiscent of some of its accompaniments. If a girl is observed who is passing through this period it can often be noted that the ruddy cheeks and robust habit of body, the warmth and activity of the child, give place to a tendency to blueness and lividity. The thyroid becomes enlarged, sometimes greatly so, in its effort to supply secretion. The face and extremities look cyanosed and the latter are cold. Apathy and syncopal attacks are not uncommon accompaniments. This is related to an, as yet, unestablished balance in the sexual hormones. Vascular spasm is characteristic. Now inquire into the history of a case of gastric ulcer and observe the resemblance. These patients almost invariably start their trouble with somewhat similar phenomena: coldness and blueness of the extremities, heliotropic complexion, coldness and not infrequently cramps in the hands and feet. If menstruation has previously been established there is frequently amenorrhœa. Then comes the indigestion: not pain after food, but a feeling of weight and fulness indicative of deficient enzyme secretion, and at last the ulcer, a little punched-out affair without surrounding thickening or inflammation. The pain characteristic of the chronic phase of gastric ulcer is a later symptom corresponding to the period of subsequent inflammation. The prodromal symptoms are those of vascular spasm like those of the climacteric. If in the female the subdominant male curve approximates the dominant female one, or temporarily crosses and recrosses it, it is quite conceivable that the results I have described might follow and an explanation be found for a perplexing trouble. The hypothesis is worth thought, especially since the administration of thyroid gland often remedies the prodromal conditions, including the amenorrhœa if it be present. I always give thyroid in gastric ulcer both during treatment and for some time after recovery.[4]

I have only one thing more to add about inherited sex metabolism in relation to disease. Over a period of 18 to 20 years in my large children's out-patient clinic I have been noting the colour of the children's eyes and some other attributes in relation to those of their parents, and it seems pretty clear that in a given generation reciprocal criss-cross inheritance is commoner than linked sex inheritance. That is to say, a girl tends to inherit her father's attributes, a boy his mother's. If a father is blue-eyed and the mother brown-eyed the sons are often brown-eyed and the daughters blue-eyed. A tall father and a small mother tend to produce small sons and tall daughters. It is this principle which has given rise to a truism that if a man wants to have clever sons he must take care to marry a clever woman. There are plenty of exceptions, but this form of inheritance is common enough to make it noticeable. Departure from this order of things is occasionally associated with some degree of intersexuality; for instance, I recently saw a well-developed girl, aged 15, suffering from asthma which began in childhood and became worse at puberty. She was a dark-haired girl with blue eyes; she tended to be hirsute about the lips and presented some other intersexual characters—e.g., triangular pubic hair. She was the blue-eyed child of a dark-complexioned and dark-eyed father and had inherited her mother's blue eyes and other characters (including asthma by the way) as though she had been intended for a boy—a confusion of hormonic coördination. This, however, is debatable ground, and there are Mendelian factors at work in this realm of inheritance.

Hypothesis based upon observation has led me to a consideration of these metabolic variations and imperfections and of their association with flaws in the balance of our bodily chemistry which may account for some of the disorders which we encounter in our everyday experiences.

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[4] Since the above was written, a man, aged 21, has been under observation in the Royal Southern Hospital presenting the clinical signs of gastric ulcer and with a history of the prodromal symptoms referred to. He was of fair complexion, had a girlish face, no signs of facial hair. The mammary areolæ broad with prominent nipples. Female distribution of the pubic hair. Testicles small. The bodily contour not masculine. This case, presenting signs of gastric ulcer, confirms the hypothesis that this disease may be related to intersexuality.

THE CELLULAR CONTENT OF MILK: VARIATIONS MET WITH UNDER PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS.*

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(*With Coloured Plate.*)

Introduction.

OF late years increasing attention has been given to the consideration of milk-supplies from the public health point of view, and the old standards, depending largely upon the senses of taste and smell, and the relative proportions of solids and cream, on specific gravity and opacity, are no longer regarded as the ultimate basis for a proper judgment as to the quality of milk. Various new methods have been introduced, especially in America, for the purpose of controlling the character of these supplies. These have for the most part been directed to the determination of two different sets of conditions: (1) The number of micro-organisms present in milk; (2) abnormal constituents in milk arising from the condition of the udder. Obviously both problems are intimately related and cover wide fields; in this paper the latter only is investigated.

American observers, attacking the problem of the cellular content of milk from the purely quantitative point of view, have formulated standards for milk inspection by which practically whole herds have been condemned; on their standards as many as 90 per cent. of a herd were condemned for producing milk which was supposed to contain pus. Such an example illustrates the chaotic state of our knowledge of the nature and source of these cellular elements of milk. At present there is no general agreement as to: (1) The nature of the cellular elements of milk; (2) the origin of such elements; (3) the significance of the presence of various types of cells; (4) the part some of these cells play in the physiological process of milk production; (5) or their significance in the various pathological processes which may occur in the cow's udder. To elucidate these problems the present work has been undertaken.

Among the difficult problems of modern dairying, still remaining unsettled, is that of the significance of the cellular elements and micro-organisms that occur in milk. On these there exists the greatest divergence of opinion, even on what appear to be the simplest questions.

W. G. Savage,[1] writing on this subject, remarks very pertinently, "That milk should not contain pus." Few will deny this, but what constitutes pus in milk? All milk contains leucocytes, but do these leucocytes become converted into pus cells, and if they do how can one be distinguished from the other? The presence of a certain number of leucocytes in milk is strictly physiological, though, beyond a certain point it may, probably does, become a pathological feature. What, then, are the bounds to be set to our characterisation of these conditions? One school holds firmly to the idea that the cellular contents of milk are all derived from the blood; that they are true blood cells, and that under certain conditions they constitute pus. Another school as firmly denies the above proposition, and asserts that the cells of milk are tissue cells of purely epithelial origin which under no circumstances can be spoken of as pus cells. As in most similar problems, the truth, as I hope to be able to demonstrate, appears to lie somewhere between.

Methods of Procedure and Examination Used in this Investigation.

These must include a method of staining which would enable the observer to distinguish the various cells that may be present. Any method which fails to include this fails, in my opinion, in its entirety. The extraordinarily divergent results described, the contradictory statements made, and the confusion which exists in the literature of the subject, are due the failure of most observers to recognise and to appreciate this elementary condition.

The cells found in milk are many and of various types. Their presence in normal milk undoubtedly must indicate, and be a measure of, the various changes which occur in the secretory tissue and ducts of the milk gland during the physiological secretory process. Given a certain physiological condition of the udder an appropriate cell indicating that condition will make its appearance in the milk. Given a pathological condition of the milk-ducts or acini, and again amongst the solid contents of the milk certain cells must predominate. The use of any method, therefore, which fails to differentiate these various cells must lack the one thing essential for our purpose. Miller[2] says: "As regards leucocyte and pus cells there is no intrinsic difference. A leucocyte in fluids other than blood plasma, as milk, for example, soon undergoes changes which render it indistinguishable from a pus cell." The oft-quoted statement of Savage,[3] that he cannot differentiate between a leucocyte and a pus cell is, undoubtedly, true so far as the comparatively few isolated cells of a clean milk are concerned, but not when applied to a large percentage of cases.

The appearance of a high cell count due to some physiological process—if we are unable to distinguish this cell from one which predominates in a pathological condition—may lead us to pronounce the udder diseased in cases in which no disease exists. The want of a method such as that above described, where alterations in the cell count have taken place, has often given rise to statements of which the following is a typical example :—

> "It was not surprising, therefore, when making consecutive observations on a carefully watched herd, to find that a cow which throughout her whole period of lactation had given a milk low in leucocytes, should suddenly develop pus, and that such a development indicated the close of her milking period. In almost 75 per cent. of the herd, perfectly healthy, clean cows show pus at the close of the milking period; and a coincident chemical analysis indicates that the percentage of butter-fat is from 0·5 to 1·5 per cent. above the normal for that particular individual. Such a condition is interpreted as indicating the termination of lactation, and accordingly the cow is at once dried off with, apparently, advantage to both herself and her calf."[4]

I hope to be able to show that although the cell count is increased in milk taken from a cow which is drying off, the condition is entirely physiological and certainly not pathological. Had the cells been properly stained with a differential stain, such a mistake could scarcely have been made. The important feature in the method I have used is that it consists essentially in a differential cell count, the cells being distinguished, counted, and classified according to their morphological characters.

An accurate knowledge of the characters of the various cells found in milk is essential for a differential count. My observations lead me to give the following cells as those to be found in milk obtained from a normal animal.

1. *The Finely Granular Eosinophile Cell.*—A polymorphonuclear cell, more or less round or elliptical or even irregular in outline, the shape depending on various factors, such as the length of time which is allowed to elapse between milking and the examination and the speed at which the milk is centrifuged.

The cytoplasm is clear, and remains unstained by Jenner's method, the whole being filled with very fine granules which stain a brilliant pink.

The nucleus, as a rule, stains a deep blue; unless the cell is old, or degenerated, when it stains badly. It may be branched or lobulated, the lobes being held together by fine chromatin threads. In nearly all the cells of this type the nucleus is seen to be formed of a thick chromatin network, some parts of which take the stain much more readily than others.

The size of the cell: The size varies between 10–12 μ in diameter. In the cells of fresh milk, examined immediately, pseudopodia stretch out from these cells in all directions, while even in many samples of commercial milk the cells are seen to be distinctly phagocytic—the bacteria being contained in vacuoles lying in the substance of the cell. (See Fig. I.) In other samples of commercial milk these cells often break down, and stain badly, the nucleus protruding through the cell cytoplasm. Crowds of bacilli may often be seen surrounding them.

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* This investigation has been carried out on behalf of the Medical Research Council.

This polymorphonuclear cell is constantly found in milk. In a normal sample the number is very small, almost negligible; but in milk from an inflamed quarter, the number may be very considerable. Fig. II. (cow 9, L.H.Q.) shows a film prepared from the deposit of milk taken from an acutely congested udder, the result of sending the cow to market with an abnormally full udder. In view of this custom of farmers and dairy owners too great stress can scarcely be laid on this point.

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The nucleus, usually of a light blue tint, is placed either in the centre of the cell or, more commonly, towards the periphery. It is either kidney-shaped or lobed, the different lobes being connected by bands of nuclear substance. In many films the cells appear to have burst; the granules are then scattered in all directions.

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4. *The Lymphocyte.*—The lymphocyte is a small blue cell which, as a rule, stains deeply. The cytoplasm is small in amount and forms a thin ring of light blue colour around the darkly-stained nucleus. These cells vary in size from 2 to 4 μ, the majority measuring about 3 μ. The nucleus is round or slightly oval in shape, stains darkly, and is not reticular. It occupies almost the whole of the cell. Such cells are fairly numerous in normal milk, but appear to be found in greater numbers in certain breeds of cattle than in others. (Fig. IV.)

5. *The Basophile Cell.*—The basophile cell (8–10 μ), a rare cell, is almost circular in shape, but may be oval. The cytoplasm is clear and transparent, and has scattered unevenly throughout its substance dark blue granules, large and small. The large nucleus occupies two-thirds of the cell, it is oval or rounded, and is always single. By Jenner's method it stains a pale blue. As a rule, the basophile cell is absent from films of normal milk, but under certain conditions it appears, though never in great numbers.

6. *The Large Neutrophile Cell* (5–9 μ).—The large neutrophile cell is extremely rarely met with. It is oval in shape, rarely round. The cytoplasm is stained a faint light blue throughout, the whole being filled, except in the region of the nucleus, with very fine granules, which take on a pale mauve tinge. By Jenner's stain the nucleus is tinged light blue.

7. *Red Blood Corpuscles.*—Red blood corpuscles are invariably present in a sample of cow's milk. In normal milk they are exceedingly few in number; as a rule, only one or two are found in a film made from the deposit of 10 c.cm. of milk. It must be remembered, however, that in milk films the individual red blood corpuscles are not exactly similar to those found in normal blood, but they are always easily recognisable.

8. *Large Epithelial Cells.*—Large epithelial cells are almost always present. They vary greatly in size, some measuring as much as 20 μ in diameter. The cytoplasm is somewhat granular, having a ground-glass appearance; it stains a more or less deep blue with Jenner's stain. The cells are usually rounded, but may be oval, and appear to have a well-developed envelope, which takes on a slightly deeper stain. The nucleus is large, oval or rounded, occupying a quarter of the cell, and stains a less deep blue than the rest of the cell. It usually has a mottled appearance as though composed of a chromatin network. In the cytoplasm of the cell are usually one, two, or even more clear spaces with well-defined outlines, usually round, more rarely oval in shape. These are fat globules surrounded by an envelope which prevents the fat from taking the ordinary fat stains.

9. *Mononuclear Eosinophile Cell.*—Other vacuolated cells appear from time to time in milk. Apart from the finely granulated eosinophile cell which may become vacuolated through age, or otherwise, there are other cells which closely resemble them. The cytoplasm of these cells, instead of being clear and transparent, stains a light pink, the substance being more or less vacuolated. The nucleus stains a light blue and is usually pushed to the side of the cell by the large number of vacuoles in the cytoplasm. These cells are abundant, especially when the cow dries off; but they may be present at other times. They may, however, be unvacuolated, when they may measure 9–10 μ in diameter, but they are often less than this. I regard this as an epithelial cell, probably derived from the secretory layer of the gland tissue. (Fig. V.)

The vital objection which can be urged against many methods of investigation is that all the cells are considered and counted as leucocytes. Obviously, in some cases of mastitis, in which the majority of the cells are of the polymorphonuclear type, the resulting count will be correct; but in more chronic cases, or in other conditions when these cells do not predominate, the methods break down, and can have little practical use.

Method of Cell Examination Adopted.

The method of cell examination adopted in this inquiry is essentially a differential count method, and a stain is used which has been found to give constant and reliable results. The procedure is as follows:—

The animal is milked in the ordinary way and at the usual times. During the milking three samples of the milk from each quarter—12 samples in all—are milked direct into sterilised test-tubes, which are plugged immediately. Of the three samples one is taken at the commencement of milking—called the "fore-milk"—another in the middle of the operation—the "middle-milk"—and a third at the end of milking (but without any undue straining)—the "strippings." Taking each of these samples in turn the tube is well shaken and 10 c.cm. poured into a centrifuge tube of Houston's pattern, the lower part of which is drawn out and accurately marked with a scale of 1/100 cm., and centrifuged at 3000 revolutions per minute for ten minutes. The cream and supernatant fluid are carefully removed, 0·5 c.cm. of milk being allowed to remain above the deposit. These are thoroughly mixed with a capillary pipette on which is a bulb and into which the mixture is finally drawn up. The pipette is then sealed off and centrifuged until the deposit is carried to the bottom of the pipette, whence with a still finer tube it may be removed and spread on a glass slide. The film is then air-dried, stained at once by Jenner's method, examined with a Zeiss 1/12, and the cells noted, described, drawn, and counted.

This method is not put forward as giving correct numerical results, but rather as a differential method in which the well-stained cells of different types may be readily distinguished.

The question now arises, are all the cells thrown down as sediment in the centrifuge, or are some carried upwards and held in position by the cream which rises to the surface? In normal milk I have found that the number of cells entangled in the cream is a negligible quantity, and it is necessary in any differential count to examine only the deposit found at the bottom of the pipette.

Cellular Content of Normal Milk.—Taking a sample of milk from any quarter of the udder of a cow selected at random one is struck at once by the variety of cells met with. Should the cow happen to be a normal animal—e.g., a heifer some days after her first calf, without any complications or udder trouble after calving—the blue cells, both large and small, which occupy the field are numerous, and at once arrest attention: indeed, one is apt to make up one's mind that the milk is full of lymphocytes both of the large and small variety. Looking over the fields one may observe here and there, not usually more than one per field, a finely granular eosinophile cell, with nucleus sharply stained, and with the granules distinctly visible; characters that enable one to pick it out without difficulty from the surrounding cells. It would be a great mistake, and very misleading, to class these cells together as pus cells; most of them are broken-down polymorphonuclear cells. Now and again a coarsely granular eosinophile cell which stains well, resembling very closely the coarsely granular eosinophile cell of ox's blood, may be seen. Again, a much larger cell, round or oval in shape, with large pale blue nucleus, the cytoplasm of the cell staining a mottled blue, may be present. Evidently these different cells cannot be lumped together as pus. Moreover, one finds in the field a number of small dots, stained deep blue, 1μ or so in diameter, sometimes with only a tag of pink substance around the blue point, or near its edge. These are obviously nuclei extruded, possibly, from blood cells, but more probably from secretory epithelial cells of the acini. The pink portion is part of the cytoplasm of the cell which was torn away when the nucleus was extruded. From this picture, which is invariably presented in the sediment from normal milk, it is obvious that a simple count can give no information as to the condition of the secreted fluid or of the secretory tissue. The number of cells (lymphocytes), added to the stray polymorphs, coarsely granular eosinophiles and tissue cells, along with the extruded nuclei, may give a high "leucocyte" count; but under these circumstances we cannot justly claim that the cow is suffering from a diseased condition of the udder or that the fluid is "pus." A differential count of cellular deposit *must* always be made before a diagnosis is justified.

Cellular Content of Abnormal Milk.—A high cell count is not of necessity evidence of a diseased udder, nor, on the other hand, does a low count necessarily indicate an udder free from disease. The actual count may, of course, in certain doubtful cases help in the formation of a diagnosis, but it cannot by itself be depended upon. For the present I insist simply on the point which I consider to be of vital importance in all cytological examinations of milk, the necessity of applying this differential staining and counting method *quarter by quarter;* for it is not sufficient to make an examination of the mixed milk by this method.

Physiological Conditions Influencing Cellular Content of Milk.—Any physiological influence which may affect the secretion of milk will also probably influence the cell-content.

Breed of Cow.—Other things being equal, such as age of cow, time which has elapsed after calving, &c., it appears that normal cows of different breeds have different proportions of cells in their milk; a thoroughbred Hereford (Fig. IV.) gives a cell-content of the milk which differs from that obtained from a thoroughbred Shorthorn (Fig. VI., L.F.Q.), and these, again, both differ slightly from the cell-content of the milk of a Welsh heifer. In the Hereford heifer the cells are of large mononuclear lymphocyte type. Large mononuclear leucocytes also appear to be present invariably in the milk from Hereford cows, but are not so noticeable a feature in the films prepared from the milk of the cows of the other breeds. The Welsh heifer's milk always contains many—indeed, they were almost the most noticeable feature—of the very small blue cells, which are almost entirely absent from the Hereford cow's milk. Owing to the large number of these small cells, the cellular content of the Welsh heifer's milk is always high. In the milk of the Shorthorn, the very small cells so familiar by their presence in the milk of the Welsh heifer are here seldom met with: their place is taken by cells with a pale-blue nucleus and a surrounding layer of granular protoplasm, the granules being very fine and staining blue. This divergence of cellular content still requires explanation.

Influence of Calving on Cellular Content.—It is well known that the colostrum obtained from the udder immediately and for a definite time after the cow has calved, differs very considerably from ordinary milk in its chemical composition, in its fat ratio, and in its cell content. It is yellow and viscid, has a strong odour, and coagulates on boiling. Besides the colostrum corpuscles—i.e., cells laden with fat globules probably derived from the epithelium of the acinus the polymorphonuclear cells are very numerous, some staining sharply, others vacuolated and evidently in process of disintegration. These colostrum corpuscles appear in such great numbers that the stained film appears quite pink, in this respect differing markedly from the film of the ordinary milk, which has a blue tinge. Lymphocytes, both of the large and small variety, though present, are not numerous; the cell with the pale-blue nucleus and granular protoplasm (with fine blue granules) predominates. The polymorphs, even in colostrum, are actively phagocytic. As the milk becomes normal the colostrum corpuscles and the polymorphonuclear cells gradually disappear; and, if no inflammatory process supervenes, the milk cells soon return to their normal count. If, however, by any chance one quarter of the udder becomes inflamed, the polymorphonuclear variety of cell persists, and is present even when the milk from the other quarters affords no trace of its presence. When one compares films prepared from milk yielded by a cow a day or so after calving with those of normal cows—e.g., Shorthorn. Clara, Hereford, and Welsh heifer—one is struck by the difference of cellular content. The colostrum corpuscles gradually diminish in number, become less distinct, and disintegrate. The polymorphonuclear cells in colostrum stain well as a rule; but towards the third or fourth day these also show active signs of disintegrating. The blue cells—the lymphocytes—are prominent throughout the whole period of colostrum production, and continue present during the transition period.

Effect of "Stage of Milking" on Cellular Content.—The first milk drawn off, usually spoken of as the fore milk, is the fluid which fills up the teat canal and the milk sinus, and usually contains fewer cells than the milk drawn off later. The sediment left in the tubes in the various centrifuge samples is, as a rule, greatest in the strippings, and one is inclined to generalise and to say that the greatest number of cells is present in these strippings. This, however, is not invariably the case.

As a rule, unless a method of milking such as the use of a milk tube is employed, the cells of all three samples are much the same as regards both type and proportion, although the absolute number may vary considerably.

Effect of Time of Milking and Intervals between this Operation on the Cellular Content of Milk.—If the interval between the morning and the evening milkings be prolonged unduly the cells increase in number, especially the polymorphonuclear cells and the red blood corpuscles; the longer the interval between these milking periods the more the udder becomes distended; the vessels become very congested, and in extreme cases, although the milk may have been normal before the distension occurred, the stained films show masses of sharply stained normal polymorphs considerably in excess of what should be present in normal milk. Fig. II., cow 9, is from a film prepared from the sediment separated from the milk of a cow whose calf had been kept away from her during one night and part of the next day. The udder was greatly distended and yielded an abnormal quantity of milk, which presented no unusual appearance to the naked eye. Polymorphonuclear cells are seen in great numbers and appear to have retained their shape; the granules stain well, and the nuclei are distinctly lobed. Red blood corpuscles are also present in fair numbers, but there is a distinct paucity of the blue cells, both large and small. The conditions in this case were very remarkable, and were certainly due to the congestion following the long interval between milking.

Relationship between the Fat Content and Cellular Content of Milk.—In no case have I found any increase in the fat content of milk where there has been a rise in the polymorphonuclear cells. The statement made by Pennington and Roberts[4] that "in almost 75 per cent. of the herd, perfectly healthy, clean cows show *pus* at the close of the milking period and a *coincident chemical analysis*, that the percentage of butter fat is from 0·5 to 1·5 per cent. above the normal for that particular individual," is certainly not borne out by the results obtained during the present investiwhile even in many samples of commercial milk the cells are seen to be distinctly phagocytic—the bacteria being contained in vacuoles lying in the substance of the cell. (See Fig. I.) In other samples of commercial milk these cells often break down, and stain badly, the nucleus protruding through the cell cytoplasm. Crowds of bacilli may often be seen surrounding them.

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gation. The cells met with in drying-off cows appear to be epithelial in type and derived from the walls of the acini.

When these cells are present the fat content rises, whilst, as will be seen from the following experiment the fat content, instead of rising with the presence of pus, actually diminishes. A goat which was in full milk had one quarter of the udder injected with 10 c.cm. of an emulsion of streptococci before the time for evening milking, and was not milked until the following morning. Films were then prepared as described above, and the milk was analysed chemically. The yield of milk and the quantity of deposit (which in this case consisted entirely of cells and streptococci) and the amount of fat present are given in the following table :—

Fat Content and Cellular Content of Milk.

Date.	Amount of milk from—			Fat per cent.		Cell content.	
	Time of milking.	Right quarter.	Left quarter.	Right quarter.	Left quarter.	Right quarter.	Left quarter.
		c.cm.	c.cm.			c.cm.	c.cm.
Feb. 27	Morning	52·5	9·9	6·95	3·11	—	—
	Evening	25·0	4·8	6·75	3·46	0·02 in 2·5	0·5 in 2·5
,, 28	Morning	64·0	11·85	5·1	4·46	0·03 in 8·0	0·4 in 2·5
	Evening	23·0	5·1	6·0	5·99	0·03	0·2
March 1	Morning	77·0	17·0	5·4	4·95	0·05 in 8·0	0·2 in 5·0
	Evening	10·5	2·5	7·71	3·04	0·01	0·13 in 5·0
,, 3	Morning	98·5	19·0	4·3	2·09	0·05 in 3·0	0·03 in 3·0
	Evening	35·0	6·5	3·45	3·24	0·05	0·03
,, 4	Morning	101·0	21·0	3·5	3·25	0·05 in 3·0	0·03 in 3·0
	Evening	31·0	7·0	—	—	0·25	0·01

It will be seen that where, as in the normal quarter (R.Q.), the amount of milk produced and the deposit thrown down remained normal in amount, in the infected quarter (L.Q.), although the yield of milk was much reduced, the deposit was greatly increased; but that the fat content, though normal in the unaffected quarter, rapidly decreased in the quarter which had received the injection of streptococci and had the larger deposit; the larger deposit being due entirely to the enormous increase of polymorphonuclear leucocytes which had all the appearance of pus cells. As the quarter gradually improved and became normal, the deposit decreased, the cells of the polymorphonuclear variety became less numerous, and the fat content again approached normal. When in acute infections of the udder true pus is produced the fat content of the milk invariably falls.

Nervous Excitement.—Nervous excitement undoubtedly has a marked effect on the milk yield of cows, but I have been unable to observe any marked change in the cellular content of milk, such as may be attributed, solely, to this cause.

Physiological "Drying-Off."—"Drying-off" should be a perfectly natural physiological process, but in some cases it may be due to pathological causes. In the normal animal when drying-off occurs the increase in the number of cells comes on quite gradually; the milk yield slowly falls off, and with this there is a corresponding increase in the number of cells, especially of one definite type. The films all present common features, and with a little practice it is possible to make a diagnosis of drying-off with great confidence. Should no differentiation be made between the various cells the condition would be diagnosed as due to previous disease, probably chronic inflammation of long standing. These drying-off cells, however, are usually circular in outline; the cytoplasm, which is often "vacuolated," contains no granules, and takes on an irregular somewhat deep pink stain. The nucleus may be single, or may be bi- or even tri-lobed, with the lobes apparently not joined together. The one, two, or even more "vacuoles" present in a single cell are stained by Nile blue, and therefore contain fat. The condition is well shown in Fig. V. of red cow, R.F.Q.

Pathological "Drying-Off."—The drying-off process may, however, be due to some pathological condition. Any severe inflammatory trouble may result in drying-off of the quarter or quarters affected. The cells are then of several varieties, the polymorphonuclear form being found in equal or even greater numbers than those described above as usually present. The inflammatory process introduces an extra factor, and may alter the cellular content to such an extent that the deposit may now be described as pus. If, however, the quarter be not severely affected, and resumes its normal function, the natural drying-off process supervenes, and the cells characteristic of that condition predominate. accompanied, however, by some polymorphonuclear cells which remain as evidences of the inflammatory process.

Sterile Milk.—It is almost impossible, from a perfectly normal heifer, to procure a sterile sample of milk. I have attempted to obtain such a sample by adopting the following procedure: The cow was placed in a large operating theatre, the floor of which was kept moist with a 3 per cent. solution of lysol. The udder and flanks were then washed and kept moist with the lysol solution, and the udder, previously washed with soap and warm water, was sponged with ether, after which the teats were again carefully wiped with sterile cotton wadding wrung out in the lysol solution. A stream of milk was then withdrawn by hand (the hands having been carefully washed and disinfected) before a sterilised milk tube was passed up the teat into the milk sinus. The milk tube connected by a piece of rubber tube to a sterilised flask (the whole having been previously sterilised as one piece) allows the milk to pass readily into the flask, which was taken to the laboratory at once and a series of plates made. Various colonies of streptococci grew as a rule, although in some cases the plates did remain sterile. It seems probable, therefore, that, in a cow which has suffered from mastitis. the infecting organisms remain in the milk ducts and sinus, live a saprophytic existence. and induce by chemiotactic influence the presence of the polymorphonuclear cells.

Pathological Conditions Affecting Milk-supply.

External Injury.—The cellular content of the milk of any quarter of an udder which has received some external injury may or may not be altered.

Abscess Formation.—A case of a slight superficial abscess came under my notice, which was opened and gradually healed, but during the time the case was under observation there was no alteration in the cellular content of the milk. If an abscess be deep and has infiltrated the gland, its presence is at once shown by the increased number of phagocytic cells: if acute, the phagocytic activity of the numerous cells is marked, if chronic and beginning to be shut off by fibrous tissue, the polymorphonuclear cells are less numerous, and less sharply defined. The other cells do not appear to be increased in numbers under these circumstances.

Experimental Inflammation.—This was done on a goat, an injection of an emulsion of streptococci being made into the L.Q. The milk from both quarters was carefully examined the day after injection. when it was found that the films from the milk of the R.Q.

remained the same as before the experiment, while those of the infected L.Q. were crowded with polymorphonuclear leucocytes. Many were actively phagocytic and had engulfed the streptococci, but many were in various stages of disintegration. It is interesting to note that the R.Q. presented no signs of any inflammation, and yielded the same quantity of milk with the same cellular content; whilst on the third day the infected quarter almost ceased to yield any. The observations were discontinued after the sixth day, when the infected quarter still gave an abnormal cell count, although from its clinical appearance one would have said that it had returned to normal.

Phagocytosis.—That the polymorphonuclear cells described above were actively amœboid and phagocytic was demonstrated in the following way. Within half an hour of milking a drop of milk was placed in a small glass chamber made by placing a ring of plasticine on a glass slide and covering it with another slide. The chamber, full of fluid, was incubated for ten minutes. The slides were then pulled apart, the plasticine ring removed, and warm normal salt solution poured gently over the slides to wash off the milk and the excess of cream; the slides were then allowed to dry and were stained by Jenner's method. The film which adheres to the upper slide is composed of wandering cells which have by their active movements made their way to the top of the chamber, while the tissue cells, together with inactive wandering cells, were found in the film on the bottom slide. The film on the top slide was composed of polymorphonuclear cells entirely, many of them actively phagocytic, while the bottom slide was covered with a film of blue cells, consisting of lymphocytes and epithelial cells with a few polymorphonuclear cells badly stained. The milk from the normal quarter treated in the same way left the upper slide entirely devoid of cells, but adhering to the bottom slide, however, were cells of all varieties. This differential arrangement seems to be a striking proof that the polymorphonuclear cells found on the upper slide are none other than the actively amœboid phagocytic cells of the blood, these being probably called out into the milk spaces by an irritant which has tended to set up an inflammation.

The cells then found in the sediment are almost all of one variety, large blue oval or round cells with granular protoplasm, and with a large delicately stained nucleus. They are not phagocytic nor amœboid, and when the modified Ponder's method is employed are found adhering to the bottom slide of the chamber. The whole subject of milk production is here involved, and it is highly probable that experiments carried out along the lines described above may give the key to the solution of a very vexed question. At all events the above experiment seems to indicate that one of the constituents of the cellular content of milk is derived from the tissue cells of the acinus, and that under special stimulation the numbers of this cell are increased, the special blood cells persisting in their original and normal proportion.

Source of Cells Found in Milk.—It is held very generally that all the cells found in milk are purely blood cells, but Winkler[5] and his school maintain that they are entirely of epithelial origin. On the one hand we have such statements as the following: "The outstanding feature in the examination of some hundred films prepared both from normal cows at different periods of lactation and from cows presenting slight signs of mastitis and representing many thousands of cells, is that *no cell having any decided resemblance to a polymorphonuclear leucocyte has been detected*, and phagocytosis of bacteria present is conspicuous by its absence." (Hewlett, Villar, and Revis.[6]) It is obviously difficult to concur in this view, the polymorphonuclear cells described in this paper being identical with those found in the blood.

These leucocytes must be regarded as pus cells when in the course of time they break down and disintegrate. The slightest inflammation of the udder is followed by the appearance of a considerable number of these cells whose characters are always the same, and whose phagocytic activity, when examined fresh, can be demonstrated. Many of my drawings show this very clearly, and I cannot agree with those observers who say that phagocytosis "is conspicuous by its absence." I am, however, in agreement with those who point out that the cell with a single oval or rounded nucleus, which stains well but not always uniformly, the cytoplasm of which is structureless and which stains well with eosin, is derived from the secretory layer of the gland tissue. This cell, which I regard as epithelial in type, is present in large numbers when the gland tissue ceases to perform its proper function as the cow "dries off." On account of its sometimes having a double nucleus it is apt to be mistaken for a polymorphonuclear cell, and by many authors it is regarded as a pus cell. The small blue cells described above as lymphocytes are really the lymphocytes of the blood-stream. Again, the coarsely granular eosinophile cells and the basophile cells which are so often present in milk undoubtedly correspond to similar cells found in the blood.

The other cells are epithelial in type, while a few are undoubtedly derived from lymphoid tissues.

Presence of the Red Blood Corpuscle in Milk.—It would not be accurate to say that *every* sample of milk contains red blood cells, but it is *undoubtedly true* that 99 per cent. of the milk samples which I have examined have contained erythrocytes. Even in normal milk—using the term in its strictest sense—I have met with an occasional red blood corpuscle. In acute congestion of the udder red corpuscles make their appearance, and they are always present also in the first milk or colostrum after calving.

Causes of the Presence of Blood in Milk.—The commonest cause of the presence of blood in milk is said to be rupture of a blood-vessel. This may be true where large numbers of erythrocytes are met with, but it is certainly not the case where the blood is detected only on microscopic examination of the milk. Apart from pathological and mechanical sources of blood it is not generally recognised with what ease the red blood corpuscle can get into the milk-stream, and the fact that this can occur is undoubtedly a factor to be taken into consideration when one considers the possibility of pathogenic organisms—e.g., the tubercle bacilli getting into the milk-stream by the same route.

So far as these observations go it is evident that the cells in milk are partly blood cells, partly lymphoid, and partly epithelial. While it is impossible to agree with the statement that "no cell having any decided resemblance to a polymorphonuclear leucocyte" is present in milk, it is obvious that to concede that all the cells in milk are pus cells is equally out of the question. Although it must be admitted that at certain times, and under certain conditions, pus cells are found in milk, it does not by any means follow that, whenever the cell count is high, we are dealing with a purulent condition.

I have endeavoured to point out that although reliance cannot be placed upon a quantitative leucocyte standard, yet, by means of the differential count, it is possible to distinguish all the various conditions most accurately, and in many cases even to make a diagnosis, and to set up a qualitative standard which may be of great service. It is, indeed, necessary not only to modify the existing standards, but to revise our whole method of diagnosis. The method described in this paper, together with the results of the investigation, indicates a method of procedure which certainly promises to give more satisfactory results as regards diagnosis than have yet been obtained.

Summary.

It is possible by means of a differential stain to distinguish very accurately the various kinds of cells found in milk. Without this it is impossible to place any reliance on so-called cell counts, as an indication of a diseased condition of the udder.

By studying the relative number and types of cells in a milk film, it is possible to make an accurate diagnosis of the condition of the quarter of the udder from which the milk is obtained, and also to ascertain whether at any previous time that quarter has been involved in inflammatory trouble.

It is also possible to detect the process of "drying off" in cows. The cells appearing in the milk during that phase being tissue cells, are easily distinguishable from the inflammatory cells—the polymorphonuclear variety.

The different cells found in milk are classified and described.

It has been pointed out that the quantitative cellular examination of milk fails because it is impossible to detect small numbers of cells when the milk is greatly diluted; nevertheless, the differential count will often draw attention to some special feature and indicate the desirability of further investigation. The differential count reaches its highest value when used for the examination of milk from individual cows, and especially of the separate quarters of the udders of such cows.

Again, much valuable information can be obtained by examining the milk from each quarter, as fore milk, middle milk, and "strippings." Usually the strippings contain the greatest number of cells, but there are notable exceptions to this rule. The amount of deposit from these samples does not always give an indication of the number of cells present.

The various factors influencing the cellular content of milk have been considered under the following heads:—

Physiological.

1. The breed of cow seems to be an important factor, for by careful examination it is possible to determine from amongst normal animals of several breeds the source of the milk sample.

2. The effect of time after calving, together with the changes in composition of the milk from colostrum to normal fluid have been noted and discussed.

3. The intervals between milking, together with the time of milking, have been shown to be factors of considerable importance in determining the cellular content of milk.

4. The question of the relation of the cream content to the cellular content shows that there is a very constant relationship between the two; with an increase of certain cells the cream may also increase, whilst with the increase of other types of cells it is decreased. An increase of inflammatory cells is invariably associated with a low cream content, but it by no means follows that the converse is true.

5. The drying off process is associated with a definitely increased output of cells, essentially different from the polymorphonuclear variety. They are tissue cells, and are not associated—as some authors maintain—with an outpouring of pus in this condition.

Pathological.

We have seen that the cellular content of milk is profoundly altered under pathological conditions. Of these: (1) some previous illness—e.g., milk fever, mastitis; (2) abscess formation involving the gland tissue; (3) streptococcic infection, whether naturally acquired or by experimental injection.

The different cells which predominate under these varying conditions have all been referred to.

Mechanical.

Lastly, the mechanical factors which influence the cellular content of milk have been reviewed and discussed.

In conclusion, it is frequently stated that milk containing pus cells is unfit for human consumption. It is therefore of the utmost importance that we should be able to determine the presence of pus in milk. If it is true that it is impossible to distinguish between a pus cell and a leucocyte, it is obviously of no use to use a numerical method of counting all the cells in a given sample of milk. The only method of distinguishing a pus cell from a normal leucocyte is by means of a differential stain and a differential count, when their presence may be readily enough detected.

(*Continued at foot of next column.*)

A CASE OF LEPROSY.

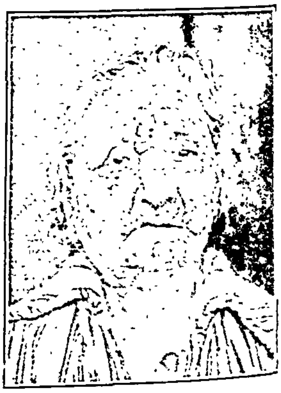
TREATED BY A VACCINE PREPARED FROM A NODULE FROM THE PATIENT'S ARM.

BY SIR NORMAN WALKER, M.D. EDIN.

With a Note on the Preparation of the Leprosy Vaccine by
Lieut.-Colonel GLEN LISTON, C.I.E., I.M.S. (Ret.),
and a Note on the Histology of the Case by
J. W. DAWSON, M.D., F.R.C.P.

(*With Coloured Plate.*)

MRS. F——, a Russian Jewess, aged 70, came to Scotland from Kovno over 40 years ago and has lived here ever since. She has been married for 52 years and has had two children, both of whom are alive and well. She states that up to four years ago she was in perfect health and had no eruption on the skin. I have questioned and cross-questioned her; I have had the assistance of the Rabbi, and her statement remains unshaken. I have tried to ascertain whether she had had living with her for any length of time compatriots from regions where leprosy is endemic, but no evidence of this is forthcoming. She came to the Royal Infirmary, Edinburgh, in January, 1923, when she presented the appearance shown in the photograph (see figure). The appearances on the face are, of course, characteristic of leprosy; the nodules were, so far as my experience goes, rather larger and redder than usual. It is, as all who have had to deal with this disease know, a common experience that a good deal of tact is required in the admission of such patients to a hospital ward, and it was some time before I thought the conditions were suitable.



She was admitted to my ward on August 24th, 1923. Nodules were excised at different stages for microscopic examination, and the findings are described later by Dr. J. W. Dawson, histologist to the laboratory of the Royal College of Physicians of Edinburgh. A few days after her admission she was put on injections of chaulmoograte of sodium, and these were continued for three or four weeks, an injection being given twice weekly. The pain, however,

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(*Continued from previous column.*)

THE CELLULAR CONTENT OF MILK: REFERENCES.

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FIG. I.

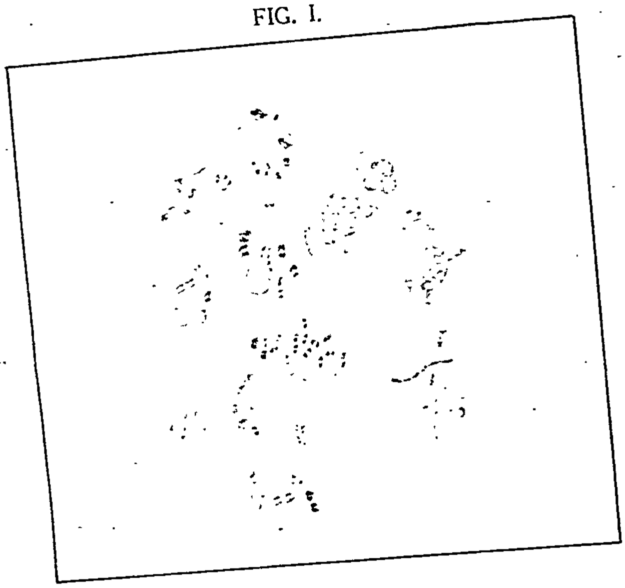


FIG. II.

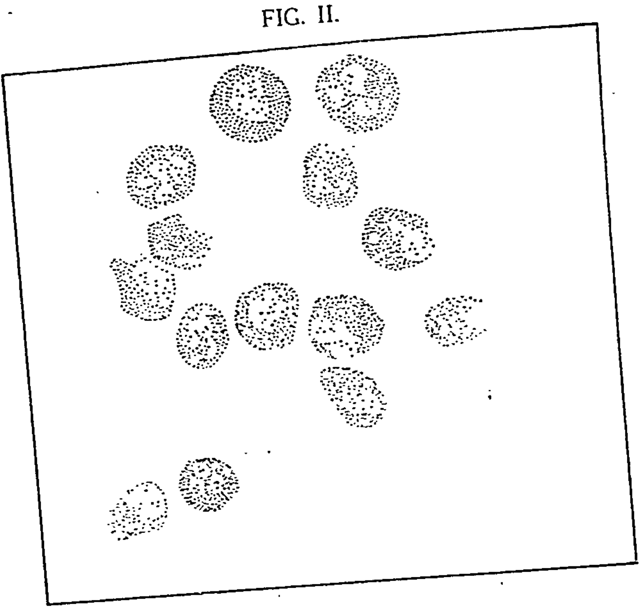


FIG. III.

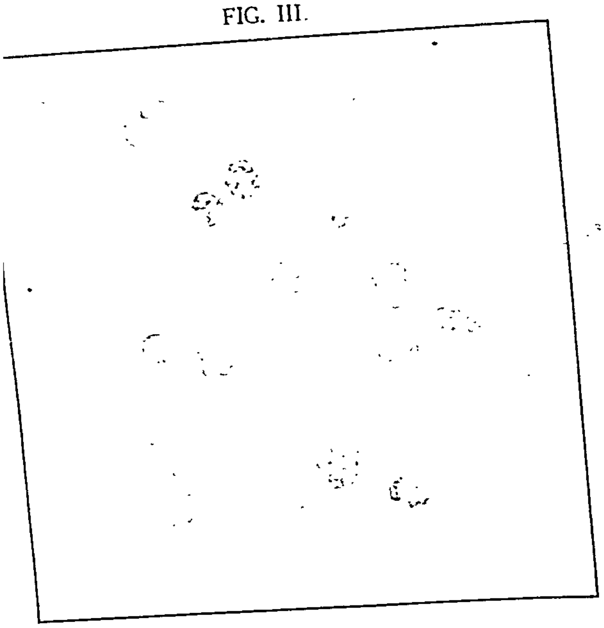


FIG. IV.

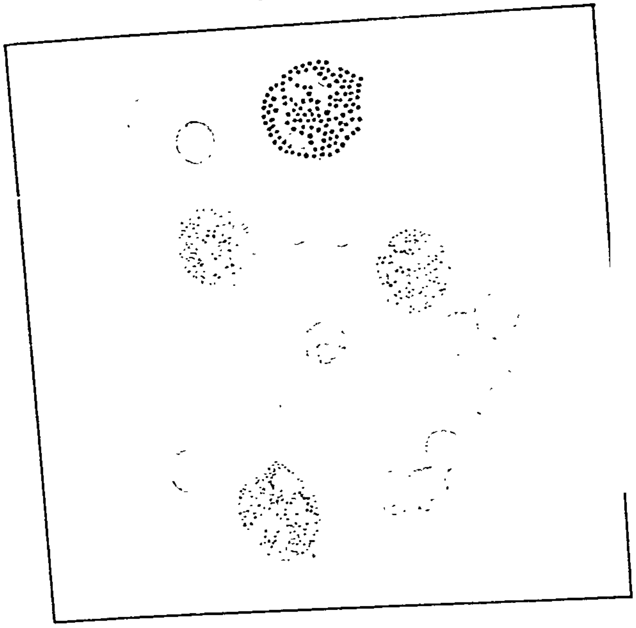


FIG. V.

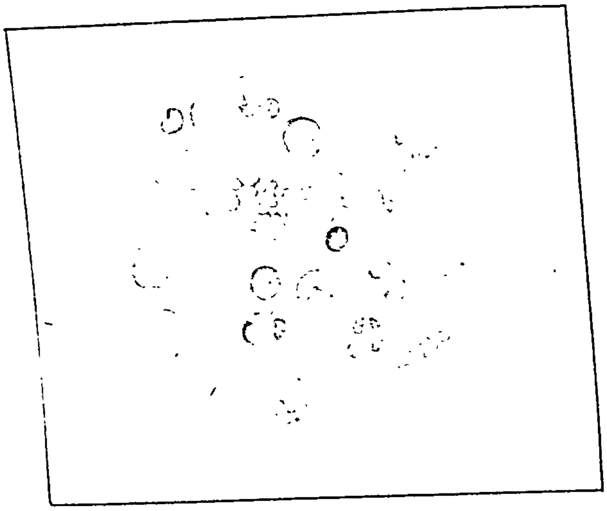
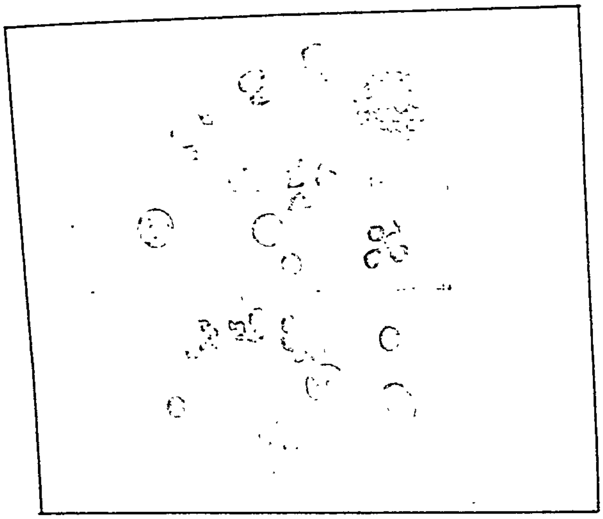
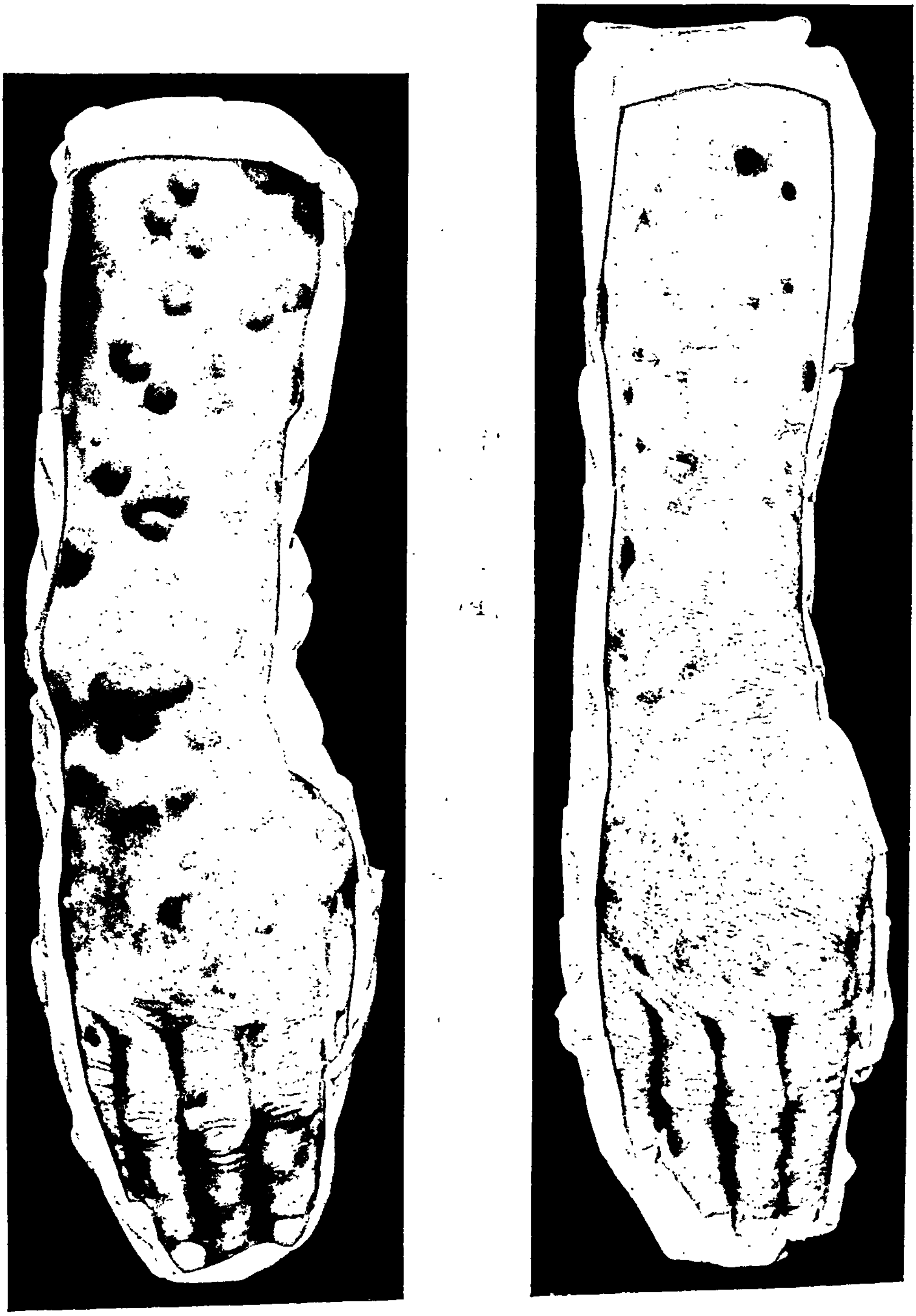


FIG. VI.



DR. P. C. VARRIER-JONES: THE CELLULAR CONTENT OF MILK.



SIR NORMAN WALKER: A CASE OF LEPROSY.

was very severe, and although she was in every way an admirable patient, her sufferings were evidently too great to warrant one in continuing the treatment.

For several years I have been treating most of my numerous cases of lupus with a vaccine prepared direct from tuberculous glands (either human or bovine) according to the method suggested by Dr. McGowan and Mr. John Fraser, with, I am convinced, very excellent results; and it occurred to me to try a similar method in this case. (See Col. Glen Liston's note below.) From October an injection was given weekly, and the first cast was taken on Oct. 4th. No pain was associated with the injection and the poor old lady's gratitude for this was quite touching. Within three weeks improvement was noticeable, and it proceeded with accelerated strides until the whole eruption had reached the stage shown in the second of the coloured casts, which was taken on April 22nd, 1924. The improvement is indeed so striking that it is not necessary to occupy space in describing it. Her general condition has improved, though at no time did she show any marked deterioration of health.

I have come across one or two references to the treatment of cases by vaccines made from the nodules, but in none are there details of such encouraging improvement as has occurred in this case. I hope others with larger opportunities will give the method a trial. Nearly 40 years is a long period of incubation, but I believe a period as long has been noted, and there does not seem to be any other explanation for the occurrence of the case. No bacilli were found in the nasal secretion.

NOTE ON THE PREPARATION OF THE LEPROSY VACCINE.

By Lieut.-Colonel W. Glen Liston,

BACTERIOLOGIST TO THE LABORATORY OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

A nodule on the skin of the forearm having been selected, the skin was thoroughly cleansed with alcohol and ether. Ethyl chloride was used to produce local anæsthesia and the nodule, having been cut out with aseptic precautions, was placed in a sterile vessel and removed to the laboratory. Here the nodule was cut into small pieces and then ground up with sterile sand in a mortar, a little normal saline being added gradually till a thick emulsion was produced. The emulsion was decanted into a sterile test-tube and allowed to stand till the heavier particles had settled. The supernatant cloudy fluid was decanted off into another tube and then examined microscopically.

It was found to consist, for the most part, of leprosy bacilli with a small quantity of cellular debris. The majority of the bacilli were present in clumps of two or more elements, so that attempts to count the number of bacilli present in the emulsion gave rather irregular results. The emulsion thus prepared was heated for half an hour at 60° C., and when diluted with carbol saline constituted the vaccine. The vaccine was put up in 1 c.cm. capsules of such a strength that approximately 200 million leprosy bacilli were present in each c.cm. The first dose recommended was 0·1 c.cm., which could be increased as indicated by the condition of the patient. She is now receiving 1 c.cm. weekly.

NOTE ON THE HISTOLOGY OF THE CASE.

By J. W. Dawson,

HISTOLOGIST TO THE LABORATORY OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

The sections of the earlier nodule show the presence of a very cellular granulation tissue occupying the superficial layers of the corium, with a slight infiltration of the deeper layers, especially along the lines of the vessels. The cells are closely placed together and consist of (1) small, rounded or oval forms, with a comparatively large, deeply-staining nucleus; and (2) large mononucleated forms in large numbers—the so-called "lepra cells"; these are fusiform or rounded and have a vesicular nucleus and often a vacuolated protoplasm. A few large cell forms with several nuclei are present, but no cells similar to the giant cells of tubercle. The actual stroma is very delicate and there are numerous thin-walled capillaries, so that there is no necrosis and no caseation. In sections stained specially for the leprosy bacillus, the large "lepra cells" are found packed with rod forms in characteristic groups, while many bacilli are present free in the tissue spaces and a few in connective-tissue cells.

The sections of the later nodule, after treatment, show that the tissue is more fibrous and much less cellular. Many of the larger cells are present, but are of a fibroblastic character. Under the low power there is a suggestion of an early focal necrosis of the cells, and the small-celled infiltration of the efferent perivascular lymphatics is less marked. In sections stained for the bacillus, a few typical "lepra cells" are still present containing rod forms, but the great majority of the large cells present contain only vacuoles or granules of varying size. The granules are present also free in the lymphatic spaces, and both within and without the cells may fuse to form small masses. As the staining reaction of the granules is similar to that of the rods, the appearances are strongly suggestive of the granular disintegration of the bacilli and are quite distinct from that of the eosinophile cell granules present.

Summary.—In the early nodule the structure is that of a cellular granulomatous tissue and the bacilli are present entirely in rod form within the "lepra cells" and free in the tissue spaces. In the later nodule there is (1) a building up of a granulation scar tissue; (2) a breaking up of the bacillary rods into granules (the "globi" of Hansen) and their gradual disappearance.

THE ACTION OF QUINIDINE IN THE TREATMENT OF HEART DISEASE.

BASED ON THE EXPERIENCES OF CERTAIN MEMBERS OF THE CARDIAC CLUB.

By JOHN HAY, M.D. Manch., F.R.C.P. Lond.,
SENIOR HONORARY PHYSICIAN, ROYAL INFIRMARY, LIVERPOOL;
PROFESSOR OF MEDICINE, LIVERPOOL UNIVERSITY.

At a meeting of the Cardiac Club in Edinburgh in 1923 there was a discussion on the value of quinidine in fibrillation of the auricles, and the members gave their varied experiences. It was suggested that it would be of some interest and value if this experience could be pooled. A questionnaire was accordingly drawn up and sent to each member, requesting information concerning the method of administration, the type of case, the nature of response, and the occurrence of any toxic effects or misadventures during the exhibition of the drug,* and the results were presented in the form of a report to the next meeting of the Club at Bristol in June, 1924.

As the administration of quinidine has become a not uncommon method of treatment in fibrillation it was thought that the publication of the results might be of service.

On attempting to analyse the figures received it was clear that only simple grouping was possible if the results were to be pooled. The cases have accordingly been arranged under three headings:—

(1) One hundred and sixty-six patients suffering from auricular fibrillation and V.D.H. (2) Eighty-seven patients suffering from auricular fibrillation but no V.D.H. This group included patients with arterio-sclerosis and myocardial degeneration, high blood pressure, syphilitic disease, and others in whom the condition of the heart muscle was not stated. The presence of mitral incompetence was not considered in itself as justifying a diagnosis of V.D.H., and such patients were included in this group. (3) Twelve thyrotoxic cases and those with Graves's disease; giving a total of 265 patients.

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* The following are the members from whom replies were received: J. C. Bramwell, T. F. Cotton, C. F. Coombs, John Cowan, J. G. Emanuel, F. R. Fraser, John Hay, C. E. K. Herapath, J. E. MacIlwaine, J. Parkinson, W. T. Ritchie, J. Starling, and K. D. Wilkinson.

Method of Administration.

This has varied considerably, and may account for the striking difference in the quality of the results obtained.

The schedules show clearly that in most successful cases the total amount of quinidine required to obtain a sinus rhythm is not large. From 1 to 3 g. is frequently sufficient, although sometimes massive doses continued over some days may succeed when the more usual dosage has failed.

The following may be taken as samples of the methods employed:

1. F. 5 gr. ter in die, increasing to 7 gr., and later to 10 gr. ter in die.

In cases that did not respond well to digitalis and in other ways were not quite straightforward, a trial dose of 2½ gr. or 5 gr. was given.

2. R. First day, 0·2 g. twice daily; second day, 0·2 g. thrice daily: third day, 0·4 g. thrice daily; fourth day, 0·4 g. thrice daily; and so on until the tenth day, when the drug is stopped if fibrillation persists.

3. C. C. 5 gr. (0·3 g.), five doses in 24 hours = 25 gr. in four days.

Digitalis is given first to slow down the heart, and is sometimes given concurrently with the quinidine.

4. B. Initial dose, 0·2 g.; 24 hours interval, followed by 0·4 g. t.i.d., increasing, if necessary, until received 0·4 g. six times a day = 2·4 g.

5. H. After initial tentative dose of 0·2 g., 2 g. is given in 24 hours in ten doses of 0·2 g., conveniently spaced. This may be increased to 3 g. per day, by doubling the amount of the quinidine in five of the ten doses given in the 24 hours.

Before the administration of the quinidine, digitalis is given if there is rapid action of the ventricles or signs of decompensation.

Treatment after the Resumption of Sinus Rhythm.

In this there is no uniformity. By some the dose of quinidine is gradually reduced and a history of palpitation or irregularity is considered as an indication to keep up the dosage for a longer period; or 0·2 g. are given twice daily for the first week, and 0·2 g. once daily for the next fortnight. Others have continued with the full dosage of quinidine whenever there is a liability to relapse, but even massive doses have failed to prevent the recurrence of fibrillation in some patients.

The general opinion is in favour of giving quinidine for some time after the restoration of a normal rhythm.

Consideration of Results of Treatment.

In each group the result is given under one of three headings:—

Failure.—Complete, in which the fibrillation persisted in spite of treatment.

Success.—Temporary. The quinidine succeeded in breaking the fibrillation, but after a few hours or weeks the auricles reverted.

Success.—Permanent. Where the normal rhythm had remained up to the date on which the schedule was sent off, or where the period of normal rhythm was of months duration.

It is hardly necessary to point out the difficulty in stating the number of permanent successes, or to give the figures truly representing the proportion of those who maintained a normal rhythm to those who reverted, because there is a constant tendency in these patients to revert to fibrillation.

Group 1.—Auricular fibrillation with V.D.H., 166 cases. Failure complete in 78; success temporary in 42, equals 120 ultimate failures; success permanent in 46. In this group of 166 cases the fibrillation was broken in 88 patients, or 53 per cent. In 42 patients the success was only temporary, which gives 120 ultimate failures and 46 successes.

Group 2.—Auricular fibrillation in hearts free from V.D.H., 87 cases. Failure complete in 28; success temporary in 24, equals 52 ultimate failures; success permanent in 35. This includes a variety of types of heart on which the fibrillation had been grafted, but the results are definitely better than in group 1. The fibrillation was broken in 59 patients, or 64 per cent.

In group 1 the percentage of permanent successes is only 27·7 per cent.; in group 2 the percentage of permanent successes is 40·2 per cent.

However, it is obvious that stress cannot be laid on these percentages, because there is no certainty about the persistence of the normal rhythm, and unfortunately sooner or later reversion is likely to recur in an indeterminate number of the patients.

In group 2 were included five patients in whom there was evidence of *markedly increased blood pressure.* In two of these the normal rhythm was maintained, in two the heart reverted to auricular fibrillation, and in one patient the normal rhythm was never attained.

There must be other instances of raised blood pressure, but they were not indicated in the schedules.

Group 3.—Including the thyrotoxic cases and Graves's disease. The number of cases reported is small, but the results are good. Cases in all, 12. Failure complete in 3; success temporary in 1, equals 4 ultimate failures; success permanent in 8.

The following are the combined figures for the 265 cases:—

Failure complete, 109; success temporary, 67, equals 176 ultimate failures; success permanent in 89.

Quinidine did, however, restore a normal rhythm in 156 of these patients, or in 59 per cent.; though in 67 the fibrillation returned.

Toxic Manifestations and Misadventures.

The administration of quinidine is not entirely devoid of danger, and not infrequently causes distressing symptoms. The reports received dealing with the toxic effects of quinidine and the possible misadventures associated with its exhibition are therefore particularly valuable, and cover 286 patients.

Certain minor results were not infrequent, such as headache, nausea, vomiting, diarrhœa, abdominal pain, giddiness, faintness, buzzing in the ears, general distress, a sense of apprehension, palpitation, precordial pain, excessive ventricular rate, orthopnœa, sweating, toxic erythema, and urticaria.

Idiosyncrasy may be marked, and it is then impossible to push the drug—a tentative dose will discover this disability. It is rare, however, to meet with a sensitiveness so marked that treatment cannot be attempted. Slight unpleasant manifestations of discomfort should not be allowed to prevent a reasonable trial.

These manifestations and misadventures are given fully. This portion of the report deals with all patients to whom quinidine was administered, and includes those suffering from paroxysmal tachycardia and auricular flutter, in addition to the cases of auricular fibrillation.

Of the 286 patients dealt with in this section of the report eight died suddenly, and embolus occurred in seven. One of the deaths in this series (1) was apparently not in any way due to quinidine.

1. One patient died about 36 hours after a single dose of 0·3 g., probably because of violent mania (death due to psychical causes and not to quinidine).

2. Death sudden and unexplained. Embolism had not occurred.

3. Quinidine stopped after two days because of fainting attacks. Died two days later, suddenly, possibly ventricular standstill. Female, 60. Exophthalmic goitre. No V.D.H. Thyroidectomy.

4. Sudden death by failure of breathing after two doses of 0·2 g. Female, 30. Mitral stenosis.

5. Normal rhythm after 75 gr. of quinidine without any trouble. Reverted in three days. On the fifth morning of the second course of quinidine his physician entered the ward and found him asleep; while he stood by feeling the pulse the patient woke up, said he felt remarkably well that morning, and died. Male, 55. No V.D.H.

6. History of numerous attacks of fibrillation. During attacks patient felt ill, but was unaware of the rapid and irregular action. Rate of heart 180 or more. Radial pulse not palpable. Full doses of digitalis had no effect and as the attack has lasted over ten days, quinidine was given. She had about 60 gr. and died suddenly. Female, 31. Paroxysmal tachycardia.

7. Patient suffering from paroxysmal tachycardia. Quinidine was administered; 2 g. were followed by cessation of the paroxysm and everything was progressing satisfactorily, when suddenly, without warning, she died. No autopsy.

8. Sudden death. Ventricular fibrillation. Autopsy: no cause of death found. Male, 27. Rheumatic, mitral disease. With great enlargement of the heart.

The following are the details in the seven cases of embolism:—

1. Cerebral embolism—right hemiplegia. Onset eight days after restoration of normal rhythm. Recovery.

2. Pulmonary embolism. Three hours after restoration of normal rhythm. Recovery.

3. Cerebral embolism. Normal rhythm after 34 g. No material change in the subjective symptoms. Four days later, left hemiplegia, hemianæsthesia, conjugate deviation to the right; no loss of consciousness, no pyrexia. Normal rhythm maintained. Male, 37. Double mitral lesion of old standing.

4. Cerebral embolism. Rhythm normal after 0·6 g. Sixteen hours later right hemiplegia and aphasia. Reversion to fibrillation 28 hours later. Female, 45. No V.D.H. High blood pressure, large heart, and persistent tachycardia. No response to digitalis.

5. Embolism of right popliteal artery and gangrene of two toes occurred within 24 hours of reversion to normal rhythm. There was also a small patch of gangrene of the right ear. Male, 52. Flutter. Normal rhythm maintained for at least 12 months.

6. Embolism in the leg within six hours of reversion to sinus rhythm. No gangrene. Male, 29. *Fibrillation.*

7. Embolism in left brachial artery within 12 hours of resumption of normal rhythm. Female, 39. Early mitral stenosis. Fibrillation.

Symptoms of ventricular stoppage were noted twice:—

1. Adams Stokes attack. Ventricular standstill. Female, aged 31. Mitral stenosis. Ventricular rate 50–60. Recovered and reverted.

2. Adams Stokes syndrome after 1·4 g. Male, 34. Mitral stenosis.

Hallucinations of light with left-sided hemiplegia, lasting a few hours, occurred in a female of 52, suffering from mitral stenosis. The sinus rhythm was only temporary. This case might fairly be included in the series of embolisms.

In another patient, a female of 44, suffering from mitral stenosis, quinidine induced epileptiform attacks with cyanosis of the face, stertorous breathing, and twitching of the hands and face. The sinus rhythm was not maintained.

Such being the probability of obtaining a normal rhythm, and such the distress and liability to accident associated with the administration of quinidine, the question naturally arises: How far are patients benefited by the resumption of a normal rhythm, and in what particular type of case should quinidine be exhibited? In other words, when is it worth while?

Cases Unsuitable for Quinidine.

There are certain patients to whom it is admittedly unwise to administer quinidine.

1. It is more than probable that little or nothing is to be gained from quinidine in badly damaged hearts with old-standing valvular disease, and more particularly if there is undoubted failure of compensation with venous engorgement.

Here digitalis *is the best* drug to administer in the attempt to control the ventricular rate and improve the reserve power of the heart.

2. Occasionally, *in a patient* who has suffered severely from angina pectoris, the onset of fibrillation is followed by the cessation of the anginal pain, and it is a question whether one should attempt to restore a normal rhythm under these conditions.

3. Idiosyncrasy. Rarely the patient is unduly sensitive to quinidine, and to push the drug induces unpleasant or even dangerous consequences.

4. All cases of acute or subacute infective endocarditis.

5. A history of embolism would be a factor against the administration of quinidine.

Cases Suitable for Quinidine.

Quinidine is most likely to be of service when the fibrillation is of recent development, and when there is but little cardiac enlargement and no valvular disease; as, for example, a case of paroxysmal fibrillation with the last paroxysm persisting.

Another favourable type of case is that of a patient in whom the onset of fibrillation was due to, or at any rate associated with, an acute infection, such as influenza or the presence of an infective focus.

A man, aged 50, who gave a history of frequent sore-throats, suffered from an acute febrile attack. Fibrillation occurred and an embolus lodged in the popliteal artery. Gangrene of two toes began. Enucleation of the tonsils was followed by cessation of fever. Quinidine, 4 gr. four-hourly, restored the normal rhthym after treatment for four days. The normal rhythm has been maintained for the past five months.

When the onset of distress definitely dates from the inception of fibrillation, and it is clear that the abnormal rhythm is the disabling factor, then the advisability of administering quinidine should be favourably considered.

Quinidine has proved of great value in the fibrillation associated with exophthalmic goitre, especially where partial thyroidectomy has been performed and the fibrillation persists. Quinidine is also valuable before operation in the milder cases of Graves's disease in which fibrillation is present.

It is clear that each case must be considered on its merits. There are no hard-and-fast rules. Often the results are far better and more permanent than was to be expected—more frequently, however, they are disappointing. Either the fibrillation persists or the recovery is only temporary.

When it is permanent most patients are conscious of some change for the better. The symptoms are ameliorated and the cardiac reserve is increased. In favourable cases a normal mode of life is resumed.

The Effect of Return to a Normal Rhythm.

Quinidine is given with the hope that it will restore a normal rhythm. Even when it is successful the result is sometimes disappointing—there may be no appreciable advantage gained, and, in fact, the patients are sometimes unaware of the change of rhythm; either because the discomfort induced by the fibrillation was so slight or, as in the case of the gravely ill, the cardiac distress, irrespective of the fibrillation, is so great that the additional disability is not appreciated. As a rule, however, the return to a sinus rhythm is accompanied by some measure of relief, the distressing palpitation is removed, and the consciousness of the irregularity disappears; and as these two symptoms are enough to cause insomnia, their disappearance is followed by restful nights and consequent benefit. Improvement is great in the thyrotoxic cases, and in them especial emphasis is placed on the relief resulting from the cessation of palpitation. With the return to a normal rhythm there is usually an increase in the cardiac reserve, sometimes, indeed, so material that work is resumed. The patient finds that he can mount stairs with greater ease and can walk farther and faster.

A male, aged 62, with a much enlarged heart but no valvular lesion, whose auricles had fibrillated for at least six years, had been unable to work during the whole of this period. He required very large doses of quinidine before the restoration of normal rhythm six months ago. Since then he has followed his occupation of traveller.

Another case was that of a female, aged 50. Fibrillation followed influenza and had persisted for six months. Œdema, extreme dyspnœa, and tachycardia were present. Since the return to normal rhythm eight months ago she has been back at work.

There is some difference of opinion concerning the degree of improvement resulting from the administration of quinidine, and from the various reports it is obvious that there is an increasing tendency to give quinidine only to carefully selected cases. There is, however, remarkable unanimity as to its value in patients suffering from exophthalmic goitre and auricular fibrillation, for these patients are especially conscious of and distressed by the rapid and irregular ventricular action, and are correspondingly relieved and benefited by the return to the normal rhythm.

In conclusion, may I thank those who have supplied me with the data from which I have completed the report: a report, presented in the hope that the combined experience on which it is based may prove of service to the profession in the use of quinidine.

NOTE ON THE DETERMINATION OF SOLUBLE "PROTEIN" IN GASTRIC FRACTIONS FROM CASES OF CARCINOMA.

By C. S. HICKS, M.Sc., M.B., Ch.B.

(From the Pathology Department, Medical School, Dunedin, New Zealand.)

It was originally shown by Wolff[1] [2] that if the contents of a stomach after an Ewald test-meal were withdrawn, filtered, and tested for protein by a special precipitation reagent,* the normal stomach did not give positive reactions in such high dilutions as fluids drawn from a stomach affected with carcinoma.

For the same reasons that the Ewald test-meal is not so valuable as the fractional method of Rehfuss,[3] so it appeared to us that Wolff's method might be better applied fractionally, and, unaware of Clarke and Rehfuss's paper,[4] we carried out some tests. Although this is only a brief account of incomplete work done during routine examinations, we feel that there are one or two points worth drawing attention to, while at the same time focusing interest on a practical method which, as Rolfe [5] points out, is, however, imperfect at present, an additional aid to diagnosis in cases where every aid should be of value.

For the proper carrying out of the test, the test-meal—that of Ryle [6] was used in this series—is given on an empty stomach in the morning. The meal consists of two tablespoonfuls of oatmeal and a quart of water boiled down to one pint and strained through muslin. A sample of resting fluid is withdrawn before administering the gruel.

The specimens are filtered, and the filtrate diluted in a series of Wassermann tubes by addition of water. Thus, the first specimen is diluted 1 : 40, the next is made by adding equal volumes of the first to an equal volume distilled water, repeating up to the required limit in each case.

It was found that the ordinary gastric test-meal so examined seldom gave positive reactions beyond a dilution of 1 : 40, and never beyond 1 : 60 towards the end of digestion. In cases of verified gastric carcinoma the results were sometimes quite remarkable, while in all cases positive results were obtained in much higher dilutions than normal. This has been pointed out by Clarke and Rehfuss,[4] the difference being that they made use of the Ewald meal of tea and toast, and apparently were able to get positive tests for protein from the same in dilutions of 1 : 320 towards the end of normal digestion. This introduced a factor which they eliminated by taking as positive pathological tests only those which showed a rapid rise in soluble protein out of proportion to digestive activity. Although, using the Ryle test-meal, this difficulty was not apparent, their reservation is a good one for conservative reasons.

Next, cases in which obvious blood had escaped into the stomach were examined with a view to discovering whether the positive tests were due to serum protein. The results were interesting. In no case of gastric ulcer, with hæmatemesis, could the high figures common in carcinoma be obtained, and further, the results, plotted as a graph, were not comparable. On examining the fractions from carcinoma cases, by precipitation with ammonium sulphate, it was found that Wolff's reaction still occurred in the filtrate, and it was concluded that the causal factor is something of the nature of proteose. Why positive tests in carcinomatous stomachs should be obtained with achylia and achlorhydria is difficult to explain, especially when an actively secreting stomach with serum effusion from an ulcer does not give such high results. It is suggested that the neoplastic tissue in breaking down undergoes autolysis and digestion more readily.

No.	Rate of emptying.	Resting fluid.		Maximum.		Maximum "soluble protein."	Final total acid.
		HCl.	Total acid.	HCl.	Total acid.		
1	1 hour	0	15	0	15	1 : 480	8
2	2½ hours	0	10	8	25	1 : 640	15
3	1 hour	0	10	0	12	1 : 640	5
4	2½ hours	0	10	0	30	1 : 1280	10
5	1¼ ,,	5	10	15	28	1 : 320	12
6	3 ,,	10	25	0	25	1 : 1280	23
7	3 ,,	2	16	8	15	1 : 280	13
8	4 ,,	0	40	0	13	1 : 640	11
9	3 ,,	5	28	4	22	1 : 320	10

The table shows data taken from fractional test-meal analyses in nine separate cases of carcinoma of the stomach. Time of emptying, as shown by rate of disappearance of food: acidity, both total and due to hydrochloric acid of the resting juice, and at the highest subsequent point reached during the test, together with the final total acid at three hours, are quoted. Maximum "soluble protein" figures represent dilutions giving positive tests at the end of the third hour—i.e., conclusions of test.

FIG. 1.

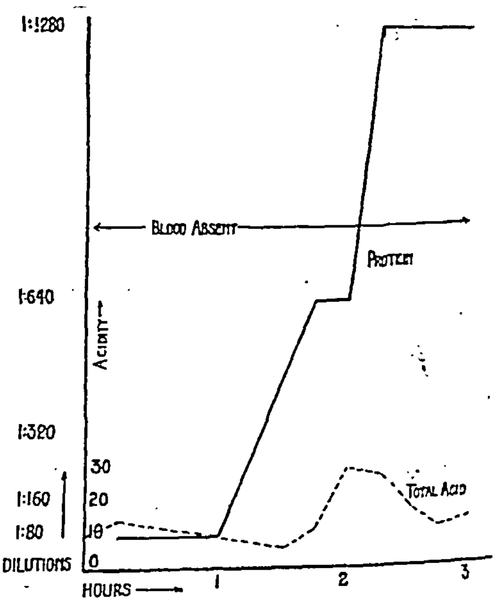
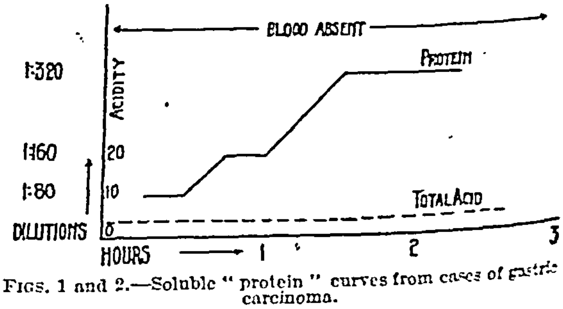


FIG. 2.



FIGS. 1 and 2.—Soluble "protein" curves from cases of gastric carcinoma.

Among the cases examined some did not come to operation for various reasons, and from those quoted which were verified either at operation or at autopsy there is not sufficient evidence to be drawn as to how the type of carcinoma affects the result. One case of fungating soft carcinoma of the pylorus gave results only up to 1 : 280—a figure reached in 90 minutes. The case came to autopsy (No. 7).

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* Phosphotungstic acid reagent: Phosphotungstic acid, 0·3 g.; alcohol, 95 per cent., 20·0 c.cm.; concentrated hydrochloric acid, 1·0 c.cm.; distilled water to make 200 c.cm. Layer the reagent with great care, on the surface of the suspected fluid, by means of a fine-bore teat pipette. Examine against a dark background.

The graph Fig. 1 represents the result of a case of inoperable carcinoma involving the lesser curvature (No. 4), and Fig. 2, that from carcinoma of the body of the stomach with much glandular involvement.

Examples of gastric ulcer with much blood effusion are given as comparisons. In both the tubes were black with "coffee grounds," and hæmatemesis had been a marked symptom. One case shows an achylia and achlorhydria, the other an almost normal acid curve (free acid not represented diagrammatically), Figs. 3 and 4, in benign achylias, and those associated with pernicious anæmia tests for soluble protein, could not be obtained in dilutions greater than 1 : 40, in all seven cases being examined.

FIG. 3.

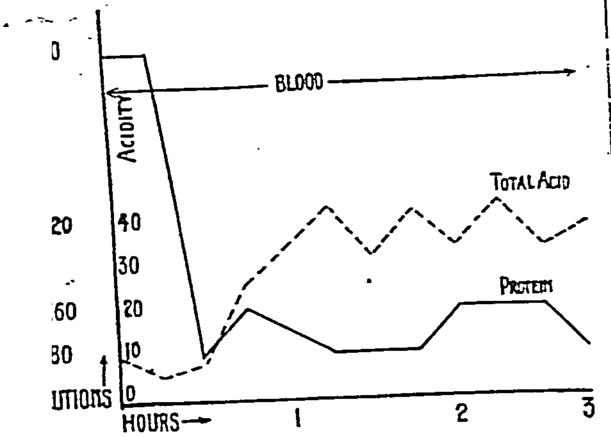
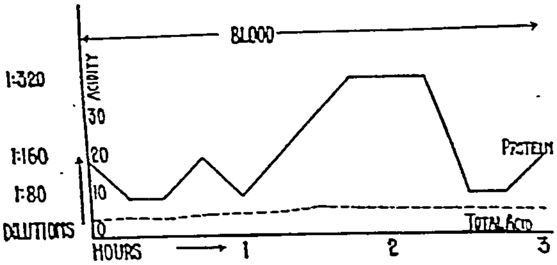


FIG. 4.



FIGS. 3 and 4.—Soluble "protein" curves from gastric ulcer cases.

In conclusion, Clarke and Rehfuss's[4] recommendation that before basing conclusions on the test all sources of protein from previous meal, from blood, and swallowed pus, &c., should be carefully excluded is a sound one, but blood effusions certainly do not give the same type of result as is obtained with carcinoma.

As it is difficult to express these results other than graphically, which method required space, it can only be stated that the gastric ulcer cases illustrated represent two of 11 separate cases studied.

Summary.

1. Serum effusion is not the factor involved in the Wolff Junghaus test for protein in gastric fractions.

2. The fractional application of the test gives results which help to distinguish a benign from a malignant achylia, and which merit closer attention in practice.

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3. Rehfuss: Amer. Jour. Med. Sci., 1914, cxlvii., 848.
4. Clarke and Rehfuss: Jour. Amer. Med. Assoc., 1915, lxiv., 1737.
5. Rolfe: Med. Rec., 1913, p. 848.
6. Ryle: Guy's Hosp. Rep., London, 1921, lxxi., 42.

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SOME NOTES UPON BLOOD TRANSFUSION IN EGYPT.

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BLOOD transfusion has been performed by us on 42 occasions in the last four years in Egypt; in 30 instances the whole blood method has been adopted; in 12 the citrated method. The conditions for which it has been employed are as follows:—

1. *Primary hæmorrhage:* as a treatment following loss of blood due to severe accidents or operations, and as a preparatory treatment in cases of severe accidents necessitating such operations as double synchronous amputations above the knees or elbows.

2. *Secondary anæmias:* as a preparatory treatment for operations upon individuals suffering from a low hæmoglobin value of the blood, particularly the secondary anæmias of ankylostomiasis and bilharziasis, where extensive operations for some organic surgical conditions are necessitated. In this respect it is our experience in Egypt as elsewhere that extensive operations performed upon individuals with 45 per cent. hæmoglobin or less are almost uniformly followed by fatal results.

3. As a stimulus to *blood formation* in such cases as the grave secondary anæmias of ankylostomiasis and bilharziasis where, although the conditions themselves are cured, the anæmia persists. It appears that the blood-forming tissues have so long ceased to function that, even when the cause is removed, the effect persists. In such extreme cases as these, showing a 10 per cent. or 20 per cent. hæmoglobin, this anæmia continues until blood transfusion is undertaken. An immediate effect of raising the hæmoglobin to 60 per cent. or 70 per cent. is observed, followed in 10–20 days by a fall, and finally succeeded, after a month or two, by a rise to 85 per cent., which appears to be the normal for Egypt as compared with Europe. Our experience suggests that in whole blood there exist certain ferments or vital substances that stimulate the blood-forming tissues to the resumption of their function. In this respect we are in complete accord with E. L. Hunt and Helen Ingleby.[1]

4. In the treatment of *deficiency diseases*, such as diabetes, pellagra, and rickets, in order to supply vital substances which may temporarily or permanently stimulate the tissues at fault to resume their function. In pellagra we believe that blood transfusion is a most valuable remedy. Following the conclusions of Wilson[2] that pellagra is due to protein deficiency, and that the accompanying gastro-enteritis prevents the digestion of proteid food, we are of opinion that this is one of the possible means of supplying the deficiency. Whole-blood transfusion has been carried out in two cases of diabetes mellitus in young men; in one case with no effect upon the sugar tolerance, in the other followed by a normal sugar tolerance for 27 days, followed by a relapse to his original condition of hyperglycæmia. This and other results suggest that such vital substances as are transfused maintain a functioning existence or produce a temporary stimulus for about 20 to 30 days.

In the cases of men who give their blood we do not find that the loss of a pint produces any debilitating effect. The loss of a litre from a healthy individual on one occasion did not prevent him walking to his home after a short interval. During the war it was the experience of one of us (R. V. D.) that as much as 1 pint of blood could be removed on three different occasions from one particularly good donor in 48 hours with no ill-effect other than a slight rise in pulse-rate. The urgency for this course was extreme, and he was kept in bed for a week subsequently.

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[1] THE LANCET, 1919, i., 975.

[2] W. H. Wilson: The Diet Factor in Pellagra.

Blood Grouping in Relation to Grafting and to Blood Transfusion.

We find in Egypt that we can verify the observations already made elsewhere[3] as to the efficacy of blood grouping in skin and bone and organ grafting as well as the transfusion of blood. In cases where, for various reasons, autogenous skin and bone grafts are impossible, we find that skin and bone of Group IV. donors are successfully incorporated by their new hosts, whereas the transfer of tissue in the presence of cross-grouping has failed.

Dr. A. T. Shousha, of the serological department of the Government of Egypt, has grouped 417 Egyptian bloods. It is his experience that the proportion of Group IV. donors is low as compared with Europe. Of those potential donors that have been tested about 24 per cent. are Group IV., 14 per cent. Group I., 30 per cent. Group III., and 32 per cent. Group II. In this respect his figures agree with the results obtained by Hirschfeld in his study of the serological differences between the bloods of different races.[4] [5] The biochemical race index of Egyptian blood is 1·07.

Blood Incompatibility in Relation to Race.

But we also find that there is no essential incompatibility in the blood of the various races in Egypt. The great majority of the rural inhabitants in Egypt are Egyptians, a race with very definite and fixed anthropological characters, brown skins and flat black hair. The type is as characteristic to-day as it was in Dynastic Egypt 2000 years B.C. The civilisations imposed from abroad upon Egypt in all the ages have largely vanished, but the fellaheen persist unchanged. There are three other racial elements most commonly met with in the cosmopolitan towns: the Negro, with woolly hair and coal-black skin; the Berberine or Negro-Arab, with less pigment in his skin and less kink in his hair; and the Levantine. The origin of the latter is uncertain, but he usually contains a mixture of Southern French, or Italian, Greek, Syrian, Turk, and Armenian grafted upon a Negro or Negro-Arab stock. We have successfully transfused blood in all these varying individuals and, on one occasion, we have successfully transplanted a bone graft from a Negro-Arab Berberine into the ununited ends of a fractured tibia of a fair-haired and grey-eyed Turco-Armenian.

There have been five instances of extreme and grave urgency where blood has been taken from untested donors and transfused. This condition is always liable to happen when the supply of tested donors fails in an emergency. In these cases it is our custom to give a small testing dose of blood as a preliminary and then to proceed after a few minutes to complete the transfusion. It was the experience of one of us (R. V. D.) in the war that, in similar circumstances of urgent need for transfusion, the
blo ungrouped grey-eyed and fair-haired Austrian
pr om Transylvania agreed most excellently
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of blood after citrated blood transfusion nor any increased tendency to ooze in the case of lacerated wounds. In the war one of us transfused three patients suffering from gas-gangrene with the blood of recovered gas-gangrene patients, but with no marked results. We have had no experience with the transfusion of immunised blood in septicæmia as suggested by Almroth Wright.[6]

Effects of Transfusion of Incompatible Blood.

We have had no grave results from the incompatibility of bloods. There has been a certain train of definite symptoms which we attribute to incompatibility. The first is an irritable cough, of the same nature as we get so often in the bilharziasis out-patient department where ambulatory cases of this disease are treated by intravenous injections of tartar emetic. The next symptom which we attribute to incompatibility of blood is præcordial pain and distress. A high temperature with or without a rigor, after transfusion, is looked upon by us as evidence of incompatibility. It is perhaps due to the fact that our procedure is to stop the transfusion upon the *supervention of these symptoms* that we have had no fatal results. But we do find upon subsequent examination that in these incompatible cases the transfused blood has no good effect, and that blood pigment appears in the urine. It is probable that the gravity of the danger of incompatibility has been exaggerated; and we are of opinion that, *in any case, there is no value in incompatible blood*, especially as an oxygen carrier.

The two possibly communicable diseases for which we examine are syphilis and malaria. In this respect our attention has been drawn to a number of Egyptians who, without any clinical evidence whatsoever of syphilis, yet give a "doubtful positive" Wassermann reaction. Making all allowances for the personal factor in the bacteriologist who decides these tests, it is yet our belief that the universal parasitic diseases of Egypt, ankylostomiasis and bilharziasis, alone may be responsible for a modified positive Wassermann reaction. This point, however, is now under investigation. We have been unable to associate ourselves with the view that blood transfusion is of value only in cases of hæmorrhage. We have found that it is equally valuable in cases of surgical shock without extreme external bleeding. This is what we would expect if we regard surgical shock as due to bleeding into peripheral capillaries.

Conclusions.

The provisional conclusions at which we have arrived are :—

1. There is no *essential incompatibility* in the bloods of the various races of men in Egypt. There appears to be perfect mutual agreement between the transfused blood of Negro, Negro-Arab, Egyptian and Levantine races as well as that of fair-haired Turks or Circassians.

2. That we can verify the observations made in regard to the value of blood grouping in tissue transference, whether glandular blood, bone, or skin.

3. That the transfusion of blood is justified in grave urgency without preliminary blood grouping. Symptoms of incompatibility can be elicited by an *initial infusion of a small testing dose of blood.*

4. That the dangers of incompatibility of blood have possibly been exaggerated, but that incompatible blood is of no value as an oxygen-carrier, though good may result from the vital substances contained in it.

5. That we can also verify the observations made elsewhere as to the stimulation of blood-forming tissues to the resumption of their function, particularly in the persistent grave anæmias of bilharziasis and ankylostomiasis.

6. That blood transfusion is of value in surgical shock.

7. That there is possibly a great future for blood transfusion in the treatment of deficiency diseases.

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[6] Quoted by Alexander Fleming and A. B. Porteous, THE LANCET, 1919, i., 973.

is no system of tooth-brushing, even with a twig, among the labouring classes. It may be more than a coincidence that goitre appears at the age when teeth become septic and gums swollen and inflamed.

The pathology of the goitres of Egypt exhibits no essential difference either in gross naked-eye appearance or in histological structure from that described in Western Europe. We can recognise all the histological differences described by Plummer.[4]

The diet of the rural population can hardly be held responsible for the incidence of colloid goitre or adenomata, though it may quite easily influence the non-development of disorders of secretion of the thyroid gland. It is almost entirely vegetarian. Meat is usually eaten once only in the week; and goat or mutton is the meat of choice. Swine flesh, as in all Moslem countries, is forbidden. So is alcohol in any of its forms, though, in the cosmopolitan towns, there is now a certain laxity in this respect. Cheese, milk, eggs, beans, spinach, and butter or oil form a large proportion of the daily diet. Onions are a constant feature of everyday food; so also, but to a lesser extent, is garlic. Fruits, such as dates, fresh figs, apricots, and water melons, are eaten in the summer months. There is no method of preserving meat by canning or smoking, or salting or drying in the sun. Nor is any chemical means employed to this end. Tinned or frozen or chilled meat is never eaten except in the towns.

The conclusions to which we have arrived in regard to the incidence of colloid goitre in Egypt are that it is almost entirely due to the polluted water-supply of the non-riparian villages. We suggest that one reason for the comparative non-development in men is possibly due to the fact that they depend less on the polluted village well and stored water than the women, for men in their field work drink from comparatively clean wells and irrigation channels. We do not feel that the universal parasitic diseases of Egypt, bilharziasis, ankylostomiasis, and ascaris, affecting as they do the men far more than the women, have any influence upon the development of diseases of the thyroid gland. Kocher and McCarrison have drawn attention to the influence of infected water-supplies.[5] [6]

Explanation of Development of Hyperthyroidism and Cretinism in Egyptian Towns.

But we are of opinion that there are many factors which may explain the absence of disorder of secretion of the thyroid; they may also supply an explanation for the rapid development of exophthalmic goitre and of cretinism in the first generation of Egyptians who migrate to the cities of Egypt.

These factors are:—

1. The diet of the fellaheen, which is almost entirely vegetarian and of a high vitamin content. In the cosmopolitan cities, however, the adoption to some extent of European food and cooking has brought with it a liability to European diseases. Thus gastric ulcer, duodenal ulcer, gall-stones, appendicitis, and intestinal cancer are found almost entirely in the Egyptian urban dweller.[7]

2. The extreme rarity of nervous diseases, either functional or acquired, among the agricultural population of Egypt. The incidence of these disorders, however, is becoming more common now among the town-dwelling intelligentsia.

3. The complete absence of intestinal stasis or of any of the subjective nervous phenomena associated with this condition among the fellaheen. Evidences of this condition with hypochondriasis and valetudinarianism can now be observed in the urban districts.

4. The essential difference in the psychology of the Orient from that of England or America. There are here no suppressed emotions or complexes; we believe that the free liberation of all the great emotions is of much importance in the consideration of Graves's disease and its comparative absence in Egypt.

5. The absence of strain and stress over financial affairs. There is great poverty; but there is no great uncertainty as to crops in Egypt. The price of cotton, parasitic diseases of the crops, and the risk of cattle poisoning cause some anxiety. But the savings of the fellaheen are invested in land or cattle, and not in such fluctuating speculations as stocks or shares or cotton futures. He may worry about the price he gets for his cotton; but the fellah never sells cotton that he does not possess. The Nile flood saves him from all anxiety in regard to seasons; and his buffalo is immune to cattle plague and to tubercle. The fellah is a fatalist; but there are nowadays many anxiety neuroses among the urban population that has not yet adapted itself to the rapid development of modern civilisation.

6. The simple uncomplicated lives led by the country people. The industrial revolution of the past century and the introduction of machinery have not altered their lives to any great extent. Yet owing to the exigencies of employment, or Government service, or education they may at one step pass from twelfth century village life to the bustle and noise of twentieth century Cairo, from the village street where the donkey is the swiftest mode of progression to the taxi-cab. We believe that it is these aspects of civilisation that are responsible for the development of hyperthyroidism in the towns.

7. The high infant mortality, 40–50 per cent., in the first year of life. Cretins in all probability would not survive.

8. The endocrine balance of the Egyptians. All disorders of internal secretion, with the exception of true diabetes, are rare. As in all the pigmented races that we have examined at autopsy the suprarenal capsule is noticeably much larger than in Western Europeans. The average weight of the Egyptian suprarenal capsule, from a series of 200 autopsies performed by the late Prof. Ferguson, when all fat has been dissected off, is 5 g.; of the European 3·5 g. We venture to bring this suggestion forward merely as a hypothesis, the justification for which rests in the fact that it indicates a line for future investigation.

NOTES ON SUPRARENAL AND PANCREATIC GRAFTING.

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The notes of four cases dealing with the above subject, here recorded, were communicated to the International Society of Surgery at the London meeting last year. The first two cases represent attempts to cure Addison's disease by homoplastic grafting.

Seeing that the use of extracts of the suprarenal glands has failed to give relief in this disease, the only rational remedy seemed to be that of grafting. As heteroplastic methods have been tried and failed, the homoplastic method appeared well worthy of trial. The difficulty of such methods, of course, is in obtaining a suitable donor.

Suprarenal Grafting.

Case 1.—The patient, a man aged 40 years, and a miner by occupation. The illness commenced in September, 1915, with occasional vomiting, accompanied by gradual weaknes shortness o so that in a few months he became ble to wall n a few yards. At the same time colour ch he became obviously pigmented.

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[4] Plummer: American Journal of Medical Sc. cxlvi., 790.

[5] Kocher: Proceeding Society of March, 1912.

[6] Mc supra.

[7] Dolbey, R. V., and Incidence in Egypt, The Lancet, 1

He was admitted to hospital, where he was diagnosed as a case of Addison's disease, and was later discharged without any relief being effected. He came under my care in February, 1916, with marked asthenia, a general bronzing, a systolic blood pressure of 110 mm. Hg, and a blood picture closely resembling that of pernicious anæmia, the red count numbering 2,200,000 cells. The nature of the disease was explained to him and the proposed treatment, which he agreed to accept. He was admitted to hospital, and on March 2nd, 1916, a suitable donor was found. This was a healthy young man who had sustained a fractured spine in a colliery accident, and was almost moribund on admission. He died during the morning, and was brought immediately to the anteroom of the theatre, where, with due precautions, the suprarenal glands were removed. The recipient was already under an anæsthetic (nitrous oxide and oxygen), and the glands, within a few minutes of their removal, after being split into two halves along the natural line of cleavage in the centre of the medulla, were inserted subcutaneously, one portion beneath the breast, the remaining portion in each supraclavicular fossa. The wounds healed by first intention, and he was discharged from hospital 10 days after the operation, and was well enough to take a train journey and after this walk five miles to his own house.

Further History.—June, 1916, much improved; June, 1917, has worked one year at light work; June, 1918, has worked one year full work in the mine. By six months after the operation the pigmentation had entirely disappeared. In July, 1918, the symptoms returned. He began to become weak and the pigmentation again appeared.

The second operation was performed in 1919, when only one-half of a gland obtained by the same method was inserted into the supraclavicular fossa. A careful examination of this site was made, but no trace of the previous graft was found. In 1920 he remained in much the same condition; in 1921 he improved, and has been earning his livelihood for the past three years as a hawker.

At the present time he is slightly pigmented, the blood picture is normal, the blood pressure 130–175 mm. Hg.

Remarks.—Although this patient cannot be said to be in the best of health, he has been seen by most of my colleagues, who have agreed as to the diagnosis. The case was not published before as it was decided to do another in order further to test the results.

CASE 2.—A woman aged 25, with typical Addison's disease; blood pressure 60 mm. Hg. She was operated on on July 7th, 1922, the grafts being supplied by a male donor, whose blood tests revealed him to belong to the group of universal donors. The operation was carried out satisfactorily and the wound healed, the blood pressure for the next few days rising to 80 mm. Hg. This improvement was not maintained, the grafts appeared to absorb in about ten days, and the patient died some weeks later.

Pancreatic Grafting.

The two other cases represent attempts to relieve diabetes by pancreatic grafting. The experimental work and pathological findings pointed to the pancreas being at fault in a considerable number of cases at least, while experimental work showed that pancreatic grafts could live in a new environment. As the injection of ordinary pancreatic extract failed in its purpose, it was thought worth while to attempt homoplastic grafting in two very severe cases that were likely to end fatally in any case.

The first patient, a man of 37, the second, a man of 32, both with grave and intractable diabetes, were grafted in July, 1916, from a male donor, the grafts being obtained immediately after death by accident. The gland was divided into thin slices, four portions being placed in the subcutaneous tissue of the abdominal wall. In one case two grafts became infected and discharged out, and in the other two degenerated, although the wound healed over them. It had subsequently to be opened to allow of the discharge of the graft and surrounding liquefied tissue. In one of these cases temporary diminution of the sugar excretion was noted, but in both cases the graft failed to relieve the diabetes. One case terminated fatally three months afterwards, the other after three years.

Not much can be said about the principles of grafting, but it seems that until we are able to understand them (and I feel we do not understand them at present, especially the chemical factors), then we must continue to fail in such operations, although they may appear the most rational treatment for the diseases for which they were attempted.

Clinical and Laboratory Notes.

EUNUCHOIDISM IN SISTERS.

By IRENE YATES, M.D., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN, ELIZABETH GARRETT ANDERSON HOSPITAL.

IN his book on endocrine diseases Falta says[1]: "Eunuchoids we term, according to Tandler and Grosz, individuals who, without being castrated, entirely simulate in their clinical manifestations the true eunuch type, or at least are extraordinarily similar to it. They are either tall, or if complications are absent, at least not stunted in growth; they show the typical fat-distribution of eunuchs, and eventually pronounced obesity; the epiphysial junctures persist abnormally long, the skeletal dimensions are characterised by an especial length of the extremities, and furthermore, the individuals show a definite psychical habitus. Finally, there is found a more or less pronounced disturbance of development of the genitalia with faulty development of the secondary sexual characteristics."

F. M. and A. M., sisters, aged 24 and 22 respectively, were sent to the Elizabeth Garrett Anderson Hospital for primary amenorrhœa. Both sisters had walked at one year; at school they were normal in height, but had grown rapidly between 14–18, since when neither had grown much. There are two others in the family, the youngest, a boy aged 17, is tall; and a sister aged 19, who is normal in height and menstruates regularly. The father is tall; the mother, of normal height, has a normal menstrual history.

The eldest, F. M., height 5 ft. 10¾ in., weight 9st. 1½ lb., is very intelligent, has a feminine voice and appearance, a boyish manner, and rather a sallow complexion. There is no development of breasts, axillary or pubic hair. The external genitalia are of the infantile female type. No hymen is present. There is a wide opening into the vagina, which is a pouch about ¾ inch in height, the uterus and ovaries are not palpable. The measurement from the umbilicus to the ground is 70 per cent. of the total height instead of the usual 60 per cent., the legs being abnormally long in proportion to the height. The upper limbs are also abnormally long. The left field of vision is normal, the right shows a slight contraction (10°) on the temporal side, both fundi are normal. The urine is normal in quantity and constituents. The sugar tolerance is normal. Systolic blood pressure is 118 mm. Hg. Wassermann reaction is negative. X ray examination shows the pituitary fossa to be normal in size and outline, the epiphyses of the long bones to be still separate from the shaft, the hands to be of the male, and the pelvis of the female type.

A. M., height 6 ft. 1½ in., weight 11 st. 1¾ lb., is intelligent, has a feminine voice, appearance and manner, and a fair skin. There is some development of the breasts; palpation suggests this is fat and not glandular tissue. There is no axillary hair, and only a few pubic hairs are present. There is an abnormal deposit of fat in the abdominal wall. The external genitalia are of the infantile female type; a hymen is present; the opening in the vagina is wide, the latter being a cul-de-sac about 1 inch in height, at the top of which is a small nodule about the size of a pea, which appears to have no opening. The uterus and ovaries are not palpable. The arms and legs are again long in proportion to the height, the measurement from the umbilicus to the ground being 66 per cent. of the total height. The fields of vision and fundi are normal. The Wassermann reaction is negative. Systolic blood pressure is 120 mm. Hg. The urine is normal. The sugar tolerance test (made by Miss E. M. Martland, M.B., B.S.) gave an abnormal result. Blood-sugar per cent. (fasting), 0·103; after half an hour, 0·215; after one hour, 0·204; after one and a half hours, 0·199; after two hours, 0·125. No glycosuria was detected during the test.

X ray examination showed the pituitary fossa to be normal in size and outline, the bones of the hands and pelvis to be of the female type, and the epiphyses of the long bones to be still separate from the shaft.

It is difficult to be certain of the psychical habitus of these girls; both say the male sex has little attraction for them. The younger has all the physical characteristics of a eunuchoid as given in the above definition: the elder has all except the is no system of tooth-brushing, even with a twig, among the labouring classes. It may be more than a coincidence that goitre appears at the age when teeth become septic and gums swollen and inflamed.

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[1] Transl. Meyers, Philadelphia, 1915.

The pathology of the goitres of Egypt exhibits no essential difference either in gross naked-eye appearance or in histological structure from that described in Western Europe. We can recognise all the histological differences described by Plummer.[4]

The diet of the rural population can hardly be held responsible for the incidence of colloid goitre or adenomata, though it may quite easily influence the non-development of disorders of secretion of the thyroid gland. It is almost entirely vegetarian. Meat is usually eaten once only in the week; and goat or mutton is the meat of choice. Swine flesh, as in all Moslem countries, is forbidden. So is alcohol in any of its forms, though, in the cosmopolitan towns, there is now a certain laxity in this respect. Cheese, milk, eggs, beans, spinach, and butter or oil form a large proportion of the daily diet. Onions are a constant feature of everyday food; so also, but to a lesser extent, is garlic. Fruits, such as dates, fresh figs, apricots, and water melons, are eaten in the summer months. There is no method of preserving meat by canning or smoking, or salting or drying in the sun. Nor is any chemical means employed to this end. Tinned or frozen or chilled meat is never eaten except in the towns.

The conclusions to which we have arrived in regard to the incidence of colloid goitre in Egypt are that it is almost entirely due to the polluted water-supply of the non-riparian villages. We suggest that one reason for the comparative non-development in men is possibly due to the fact that they depend less on the polluted village well and stored water than the women, for men in their field work drink from comparatively clean wells and irrigation channels. We do not feel that the universal parasitic diseases of Egypt, bilharziasis, ankylostomiasis, and ascaris, affecting as they do the men far more than the women, have any influence upon the development of diseases of the thyroid gland. Kocher and McCarrison have drawn attention to the influence of infected water-supplies.[5] [6]

Explanation of Development of Hyperthyroidism and Cretinism in Egyptian Towns.

But we are of opinion that there are many factors which may explain the absence of disorder of secretion of the thyroid; they may also supply an explanation for the rapid development of exophthalmic goitre and of cretinism in the first generation of Egyptians who migrate to the cities of Egypt.

These factors are:—

1. The diet of the fellaheen, which is almost entirely vegetarian and of a high vitamin content. In the cosmopolitan cities, however, the adoption to some extent of European food and cooking has brought with it a liability to European diseases. Thus gastric ulcer, duodenal ulcer, gall-stones, appendicitis, and intestinal cancer are found almost entirely in the Egyptian urban dweller.[7]

2. The extreme rarity of nervous diseases, either functional or acquired, among the agricultural population of Egypt. The incidence of these disorders, however, is becoming more common now among the town-dwelling intelligentsia.

3. The complete absence of intestinal stasis or of any of the subjective nervous phenomena associated with this condition among the fellaheen. Evidences of this condition with hypochondriasis and valetudinarianism can now be observed in the urban districts.

4. The essential difference in the psychology of the Orient from that of England or America. There are here no suppressed emotions or complexes; we believe that the free liberation of all the great emotions is of much importance in the consideration of Graves's disease and its comparative absence in Egypt.

5. The absence of strain and stress over financial affairs. There is great poverty; but there is no great uncertainty as to crops in Egypt. The price of cotton, parasitic diseases of the crops, and the risk of cattle poisoning cause some anxiety. But the savings of the fellaheen are invested in land or cattle, and not in such fluctuating speculations as stocks or shares or cotton futures. He may worry about the price he gets for his cotton; but the fellah never sells cotton that he does not possess. The Nile flood saves him from all anxiety in regard to seasons; and his buffalo is immune to cattle plague and to tubercle. The fellah is a fatalist; but there are nowadays many anxiety neuroses among the urban population that has not yet adapted itself to the rapid development of modern civilisation.

6. The simple uncomplicated lives led by the country people. The industrial revolution of the past century and the introduction of machinery have not altered their lives to any great extent. Yet owing to the exigencies of employment, or Government service, or education they may at one step pass from twelfth century village life to the bustle and noise of twentieth century Cairo, from the village street where the donkey is the swiftest mode of progression to the taxi-cab. We believe that it is these aspects of civilisation that are responsible for the development of hyperthyroidism in the towns.

7. The high infant mortality, 40–50 per cent., in the first year of life. Cretins in all probability would not survive.

8. The endocrine balance of the Egyptians. All disorders of internal secretion, with the exception of true diabetes, are rare. As in all the pigmented races that we have examined at autopsy the suprarenal capsule is noticeably much larger than in Western Europeans. The average weight of the Egyptian suprarenal capsule, from a series of 200 autopsies performed by the late Prof. Ferguson, when all fat has been dissected off, is 5 g.; of the European 3·5 g. We venture to bring this suggestion forward merely as a hypothesis, the justification for which rests in the fact that it indicates a line for future investigation.

NOTES ON
SUPRARENAL AND PANCREATIC GRAFTING.

BY F. C. PYBUS, M.S. DURH., F.R.C.S. ENG.,
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THE notes of four cases dealing with the above subject, here recorded, were communicated to the International Society of Surgery at the London meeting last year. The first two cases represent attempts to cure Addison's disease by homoplastic grafting.

Seeing that the use of extracts of the suprarenal glands has failed to give relief in this disease, the only rational remedy seemed to be that of grafting. As heteroplastic methods have been tried and failed, the homoplastic method appeared well worthy of trial. The difficulty of such methods, of course, is in obtaining a suitable donor.

Suprarenal Grafting.

CASE 1.—The patient, a man aged 40 years, and a miner by occupation. The illness commenced in September, 1915, with occasional vomiting, accompanied by gradual weakness and shortness of breath, so that in a few months he became unable to walk more than a few yards. At the same time his colour changed, and he became obviously pigmented.

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[4] Plummer: American Journal of Medical Science, 1913, cxlvi., 790.

[5] Kocher: Proceedings of Royal Society of Medicine, March, 1912.

[6] McCarrison: Vide supra.

[7] Dolbey, R. V., and Mooro, A. W.: The Incidence of Cancer in Egypt, THE LANCET, 1924, i., 587.

tion the condition of the patient did not warrant an investigation of the blood-supply of the floating bowel. Its appearance was pale and led one to believe that the blood-supply was not as fine as that of the rest of the bowel. Since operation, however, the patient has remained well and the blood-supply, however curtailed, seems to be sufficient.

The fact that with the cæcum floating the point of maximum tenderness was over McBurney's point is an example of pain referred to the ninth and tenth thoracic nerves.

Reviews and Notices of Books.

OBSTETRICS.

A Text-book for the Use of Students and Practitioners. Fifth enlarged and revised edition. By J. WHITRIDGE WILLIAMS, Professor of Obstetrics, Johns Hopkins University. London and New York: D. Appleton and Company. 1923. Pp. 1076. 40s.

FOR 20 years this excellent text-book has been before the profession, and each succeeding edition has served but to increase its value and the esteem in which it is held. As a monument of careful observation and record it has few equals, and its importance is enhanced by the clear judgment and care which the author exercises throughout.

To the practising obstetrician the work is essential, and in the fifth edition the practitioner will find a useful and conservative guide to the modern treatment of all obstetric difficulties with which he may be confronted. All recent writings of importance have received consideration, and the march of progress is duly emphasised. At the same time Prof. Whitridge Williams issues a strong and, we think, justified plea in many directions for conservatism. He draws attention to the fact that recent American statistics have shown a definite rise in the puerperal death-rate in that country, and that child-birth was actually more dangerous in America in 1921 than in 1916. Further, this death-rate is greater in urban than in rural communities. He attributes this to the fact that many practitioners have been led astray by the teaching of those who regard labour as a pathological rather than a physiological process, and he thinks that unjustifiable interference is frequently undertaken by those who do not fully appreciate the risk involved. It is interesting to note that an inquiry by a committee of the Massachusetts State Medical Society into the puerperal death-rate showed during the year 1921 that after puerperal infection Cæsarean section ranked in America as the most frequent cause of death from child-birth. It is but natural, therefore, that the author has some strong remarks to make not only against the abuse of this operation, but against obstetric meddling in general. In fact, the keynote of conservatism is noticeable throughout the volume. We welcome this expression of moderation, coming as it does at an epoch when excess of operative zeal is tending in some quarters to displace the true art of obstetrics, to the detriment, we fear, of maternal well-being.

The book follows the general arrangement of its predecessors, but each chapter has been thoroughly overhauled and brought up to date. There is, for example, a full and instructive criticism of Potter's monograph on the "Place of Version in Obstetrics," in which the author adduces very cogent arguments against the general acceptance of Potter's teaching. Recent methods of diagnosis such as the use of X rays in the investigation of pelvic contraction and fœtal positions are discussed, and full references given. In fact, the unusually complete bibliography appended to each chapter, indeed almost to each paragraph, is a feature of the book which makes it invaluable as a work of reference. The details of obstetric management which the author advocates are, generally speaking, those in use in this country. A few variations occur. For example, Prof. Williams appears to favour the use of de Ribes's bag in preference to bipolar version in the treatment of placenta prævia, chiefly, as he says, in the interest of the child. Again, when discussing post-partum hæmorrhage no mention is made of bimanual compression of the uterus, a method which is always available and usually effective. The book has been enriched by several new illustrations well reproduced.

NOUVEAU TRAITÉ DE MÉDECINE.

Fascicule XI.: Pathologie de l'appareil respiratoire (*nez, larynx, trachée, bronches, poumons*). By FERNAND BEZANÇON et S. I. DE JONG, H. BOURGEOIS, HUTINEL et PAISSEAU, P. HARVIER, L. RIBADEAU-DUMAS. Paris: Masson et Cie. Pp. 636. Fr.45.

WE have in previous reviews had occasion to call attention to the general excellence of the system of medicine, of which the present is the eleventh volume. This high standard is here maintained, the logical arrangement and clear description of physical signs, morbid anatomy, and general pathology being in the best tradition of French medical writers. The relegation of pneumonia to the volume dealing with infections leaves a gap in this volume, but the field here covered is enormous. Many English readers will cavil at the description of asthma by Prof. F. Bezançon and S. I. de Jong, who, whilst making some reference to protein-sensibility, continue to deal with the disease mainly from the respiratory point of view. Even hay fever is said to be a disease, occurring chiefly in America, and the modern conception of asthma as a toxic idiopathy is almost ignored.

We commend the volume as a corrective to insularity as well as on account of its completeness and admirable style.

PHYSICAL DIAGNOSIS.

Eighth edition. By RICHARD C. CABOT, M.D., Professor of Medicine in Harvard University; formerly Chief of the West Medical Service at the Massachusetts General Hospital. London: Baillière, Tindall and Cox. With 6 plates and 279 illustrations. Pp. 536. 25s.

THE new edition of this well-known book maintains the high standard of its predecessors, and should tend to make it still more popular. Every medical student should possess a copy. The minutiæ of examination are clearly described, and the proportion of space given to such fundamentals as the technique of percussion and auscultation is adequate. A notable change from former editions occurs in Chapter XVIII., where Dr. Cabot has completely revised his views on emphysema. "Till 1921," he writes, "I thought I could recognise emphysema. The following facts have disillusioned me. In 12 cases diagnosed as emphysema at the Massachusetts General Hospital, only three showed any emphysema post mortem. On the other hand, of the 153 cases demonstrated post mortem, only seven were recognised in life." "I know to-day nothing about the physical signs of emphysema," he says later, and proceeds to write an illuminating chapter on the "barrel chest" distinguished alike by its clarity of description and absence of dogmatism. The plates and illustrations are admirably reproduced.

PRACTICAL ELECTROTHERAPEUTICS AND DIATHERMY.

By G. BETTON MASSEY, M.D., Fellow and former President of the American Electrotherapeutic Association. London: J. and A. Churchill. 1924. Pp. 401. 21s.

IN the first nine chapters of this book the author deals with the various currents used in medical electricity. He describes their nature, the methods of producing them, and their action on the body. In the remaining chapters (X. to XIX.) electrical treatment of various diseases and symptoms is abnormal fat deposit. I consider that the data in both cases justify their classification as eunuchoids. Eunuchoidism in females is extremely rare, and I find no record of its occurrence in sisters.

My thanks are due to the various members of the staff of the hospital who helped in the investigations, and to Mr. Ulysses Williams who kindly took the X ray photographs.

NOTE ON AN UNUSUAL CAUSE OF DEATH IN SUBACUTE INFECTIVE ENDOCARDITIS.

By M. Weinbren, B.Sc. (South Africa), M.R.C.S. Eng.,

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AND

The late T. H. Jamieson, M.D., M.R.C.P. Edin.,

LATE VISITING PHYSICIAN TO THE HOSPITAL.

In view of the unusual termination the following case is of interest.

W. L., aged 35, enlisted in 1908, and was discharged in January, 1919. His invaliding disability was V.D.H. with aortic insufficiency, the date of origin being uncertain, and he gave a history of malaria contracted in East Africa in 1914.

Condition on Admission.—When admitted into Orpington on May 5th, 1923, he was anæmic and his general condition was poor. The apex beat was in the fifth space, just beyond the nipple line, and the right border of the heart at the right edge of the sternum. A loud systolic bruit could be heard all over the chest, loudest in the mitral area, and a faint diastolic murmur could be heard in the mitral area and along the left border of the sternum. The liver was enlarged to about one inch below the costal margin and the spleen was palpable on inspiration. There was no œdema of the legs and no signs of fluid in the abdomen. During the period in hospital he ran an intermittent temperature between 100° and 97·5° F., and his pulse varied between 104 and 84. A Wassermann test proved negative. Blood cultures also proved negative. The urine showed a good trace of albumin, a few blood casts, and a fair number of pus cells.

On June 27th he complained of a sudden stab of pain in the left chest, radiating from the left costal margin to the left clavicle, and recurring with every inspiratory movement. There was considerable tenderness and rigidity below the left costal margin, and a to-and-fro rub was detected over the splenic area. His pulse was 98 and temperature 97·8° F. Splenic infarct was diagnosed. The patient steadily improved, the pain, rigidity, and tenderness passing off at the end of a week. The spleen was then found to be more easily palpable than on admission.

On July 16th, although feeling much brighter during the day, he complained of a sudden attack of giddiness about 7 P.M. and died within 15 minutes. Autopsy showed the heart to be enlarged. There was no pericarditis and no naked-eye changes in the muscle wall. There were few firm vegetations on the aortic valve and there were vegetations on the mitral valve, which was greatly thickened and had an arc ulcerated away from the anterior flap. The aorta was healthy. On opening the abdomen it was found that the whole peritoneal cavity was filled with blood clot, and post-peritoneal blood staining was seen on the left side of the vertebral column adjacent to the spleen and left kidney. An attempt was made to trace the source of the hæmorrhage. No aneurysm was found and no ulceration or any change of note in the stomach or intestines. The kidneys were enlarged, pale, fatty, and had a flea-bitten appearance. On removing the spleen (which was enlarged, weighing 19½ oz.) a transverse yellow infarct, which on section was seen to be lined with a dark red layer, showing that it was of recent origin, was found at the upper pole. Quite separate from the infarct, on the diaphragmatic surface of the spleen, was a discoloured area about three inches in largest diameter. The capsule of the spleen, both serous and fibro-elastic coats, was detached from the pulp, and it was evidently from this area that the hæmorrhage had taken place, the blood having oozed into the retro-peritoneal tissue and not through the hilum or lieno-renal ligament. On section, a large cavity was seen in the centre of the spleen and the tissue round it, microscopically, was found to be quite necrotic.

The cause of death was evidently a blood-vessel giving way in the necrotic portion of the spleen, which was probably a soft infarct. The capsule of the spleen tearing with the increased pressure allowed the patient to bleed to death. We have been unable to trace any record of a similar termination to a case of subacute infective endocarditis.

The Director-General of the Medical Services of the Ministry of Pensions kindly gave us permission to publish the case.

MOBILE ASCENDING AND TRANSVERSE COLON.

By T. A. B. Harris, M.B., B.S. Melb.

The following case is of interest, both on account of the infrequency of the condition and of the trouble it may give the surgeon.

E. B., female, aged 16, was admitted to Ipswich Hospital, Queensland, on June 13th, 1923. There was a history of three separate attacks of sudden pain in the lower abdomen, settling down into the right iliac fossa, with constipation, fever, dry tongue, and rapid pulse. On admission she was definitely tender over McBurney's point. A diagnosis of chronic appendicitis was made, and an appendicectomy performed on June 14th. The cæcum, ascending and transverse colons were located on the left side lying parallel to the descending colon, and entirely covered with small bowel. The appendix showed signs of recent inflammation and was removed. The cæcum, ascending colon, and half the transverse colon were entirely free and had no attachment and no mesentery. The bowel was pale in colour, and the great omentum was very short (2 inches). No attempt was made to anchor the floating bowel, as the patient was beginning to feel the effect of the excessive manipulation necessary to locate the appendix. She made an uninterrupted recovery.

Comments.

In early fœtal life the colon lies entirely to the left side of the abdomen attached by a mesentery to the posterior abdominal wall. With the elongation and growth of the small intestine that portion which eventually forms the cæcum, ascending and transverse colon swings to the right side, and at the fourth month of extra-uterine life the cæcum is found immediately below the liver (F. Treves). From this time the large intestine grows in length and size, and takes up the position found in the normal adult. G. E. Waugh[1] describes cases of irregularities of the colon under four main heads: (1) Undescended cæcum. (2) Mobile ascending colon and cæcum in which it has descended, but has retained its primitive mesentery. (3) Mobile ascending colon and cæcum in which it has descended and has been fixed, but has acquired a false mesentery. (4) Two cases in which the whole of the colon lay in the left iliac fossa, having made no attempt at rotation from its primitive position to the right side of the body. In one case—a girl, aged 11 years—chronic appendicitis had been diagnosed; in the other—a woman, aged 22 years—treatment for gastric ulcer had been given for nearly two years before operation. At operation no disease of the appendix or stomach was present in either case. Radiograms of barium meals, taken previously to the operations, had failed signally to indicate the presence of the abnormality in both cases—in fact, the right colon appeared to be in a more or less normal position in the right iliac fossa and pelvis. A primitive dorsal mesentery was present along the whole length of the alimentary tract from duodenum to rectum.

In this case there seem to be two alternative explanations. It may be that the colon had failed to rotate to the right side, while developing normally as regards shape and size, and together with this had lost its primitive mesentery. The other explanation may be that it has developed in a normal manner, but has failed to become anchored to the posterior abdominal wall and has lost its primitive mesentery, which is the more probable explanation. At opera-

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[1] Waugh, G. E.: Brit. Jour. Surgery, January, 1920; Brit. Med. Jour., November, 1922.

Prof. J. Bauer (Hamburg), and Prof. M. Stoob (Berne), but also for the coloured photographs of the rashes and the lesions of the exanthemata, which are models of accuracy. The third volume deals with diseases of the digestive, respiratory, and circulatory systems, and achieves a level as high as that of its predecessor. If it is not invidious to select certain articles for special mention, attention might be directed to those by Prof. E. Feer (Zurich) on congenital pyloric stenosis, and by Prof. St. Engel (Dortmund) on diseases of the lungs. Too big for the needs of general practice, this handbook should certainly be on the shelves of all medical libraries.

Johannes de Ketham.

The Fasciculus Medicinæ of Johannes de Ketham, Alemanus. Facsimile of the first (Venetian) edition of 1491. With Introduction by Karl Sudhoff. Translated and adapted by Charles Singer. London: Humphrey Milford, Oxford University Press; Milan: R. Lier and Co. 1924. Pp. 56 and 13 plates. 46*s.*

This sumptuous production is of interest as the first printed general manual of professional information for medical men; it includes not only treatises on medicine, but also upon midwifery and surgery. Prof. Sudhoff gives reasons for thinking that Ketham is really a variant of Kircheim, and Johannes de Ketham was, in fact, a Swabian, Johan von Kircheim, Professor at Vienna about 1460. He compiled the Fasciculus from various manuscripts and sets of rules for medical practice which were in vogue before his time. The book opens with an account of the urine and the various diagnoses to be made from an inspection thereof; there follows an elaborate section upon bleeding, and next come a section upon gynæcology, one on generation and midwifery and a surgical section. The final section is an attempt at a short dictionary of medicine.

As an appendix is given the interesting tract of Peter of Tussignano on the plague, with rules for avoiding infection and indications for treatment. This treatise is well worth reading. In one passage in a section upon various doubtful points, he discusses the question (in the ninth doubt) as to whether monks and prisoners do not die of the plague, although he adds, "sometimes they all die, and at other times not so." The answer is as follows: Those who live in a closely guarded community are not so much exposed to infection as those outside. But if one of the community should become infected the infection rapidly spreads. It must be noted that in the Black Death of 1348–49 the mortality among the regular clergy was exceedingly high.

All those interested in medical history owe a debt of gratitude to those who have made this most interesting treatise available at a comparatively moderate cost to modern readers.

Quantitative Organic Microanalysis.

By Fritz Pregl, D.Sc., Ph.D., Professor of Medicinal Chemistry; Principal of the Medico-Chemical Institute of the University of Graz. Translated by Ernest Fyleman, B.Sc., Ph.D., F.I.C. London: J. and A. Churchill. 1924. Pp. 190. 12*s.* 6*d.*

Dr. Pregl's work on micro-analysis is too well known to require introduction to anyone conversant with continental chemical literature. It will be remembered that he evolved the technique for the ultimate analysis of very small quantities of organic compounds. By his method carbon and hydrogen can be determined accurately in quantities weighing 7 to 13 milligrammes, whilst sulphur and halogens can be estimated in even smaller quantities. Up to the present detailed accounts of these techniques could only be obtained from German publications, such as Abderhalden's *Biochemischen Arbeitsmethoden* and Weil's *Methoden*. The present volume is therefore the only account of micro-analytical methods published in English. The descriptions are full of such minute details as to astonish any reader unaccustomed to German analytical methods, but these details are very necessary if the technique is to be carried out efficiently.

With the increasing importance of biochemistry, and particularly with that section dealing with chemotherapy, the need for micro-analysis has become urgent, and the volume will be welcomed. The translator deserves praise for his careful work.

The Conquest of Constipation.

By William S. Walsh, M.D. London and Toronto: J. M. Dent and Sons, Ltd. Pp. 265. 5*s.*

This book contains a certain amount of scientific fact in a mass of popular description. For the medical reader it will have little interest, and for the lay reader we fear that it will tend to accentuate those psychic effects of constipation which may be so disastrous. The author writes fluently, and his book is well printed and of a useful size.

JOURNALS.

Biochemical Journal. Vol. XVIII., No. 384. 1924.—This issue commences with an obituary notice of the late Prof. Tigerstedt, in which his work is reviewed. The majority of the papers deal with the chemical side of the subject, but there are some of direct clinical interest.—In her paper entitled Calcium Content of the Blood During Pregnancy, Part II., Miss S. T. Widdows describes the extension of her work to pathological cases. In a previous paper the calcium content was found to vary with the stage of pregnancy. Thus, there is a drop in the calcium content after the eighth month. In abnormal cases, such as those of albuminuria, eclampsia, the fall occurs earlier, at about the fourth month of gestation.—K. Tallerman, in his communication on the Type of Sugar Excreted in the Urine of Normal Persons, describes experiments designed to throw light on the nature of the blood-sugar. He reviews very briefly the current views concerning α, β, and γ glucose, and refers to the work of Winter and Smith, who stated that sugar in normal blood was in the γ form. It will be remembered that they claimed that the sugar of diabetic blood was in the β form, and that insulin converted the β to the γ form. Tallerman calls attention to the criticisms of Hewitt on the drastic methods of heating the blood prior to polarimetric observation, and suggests that examination of the urinary sugar might clinch the matter. From a series of careful experiments Tallerman concludes that the sugar excreted by normal persons after an injection of phloridzin is in the α β form. Also that passed by diabetics wus not γ glucose. He therefore concludes that it is extremely unlikely that γ glucose is present in the blood or urine of normal persons.—H. W. Dudley describes the preparation of insulin from the pancreas of cod fish. The islets were dissected out on the trawlers and were preserved in aqueous solutions of picric acid. By means of an extraction process, described in the paper, large yields of insulin were obtained. Thus, even after the fish had been dead for 24 hours, a yield of 13·12 rabbit units was obtained. The author has worked out that the islet tissue of the cod fish contains about ten times as much insulin, weight for weight, as the human pancreas.—There are also papers on rickets and vitamins by E. M. Luce and R. Robinson and E. M. Soames.

British Journal of Children's Diseases. Vol. XXI. July–September.—Dr. Sydney A. Owen and Dr. A. Neave Kingsbury contribute a paper on the described. Dr. Massey devotes a special chapter, the longest in the book, to the subject of the treatment of malignant growths by zinc ions, a method to which he has devoted many years of study. Full details of technique used by him are included, the results being illustrated by photographs of the patients before and after treatment. The cases figured have been kept under observation for not less than two years, and, judging by the illustrations and descriptions, the results appear to be excellent. Currents of 2000 or even 3000 milliampères were used in some cases, and by confining them to the growth and its immediate vicinity the dangers which would attend the uncontrolled use of currents of this kind and strength are avoided. Currents of this strength produce enough heat to coagulate the tissue proteins. The destruction of the growth is caused, therefore, by heat as well as electro-chemical cauterisation. In another chapter the author describes a method of treating tuberculous glands and cystic goitre by zinc ions. The chapter entitled Electricity in Industrial and Reconstructive Surgery deals almost entirely with the testing of electrical reactions. The method described is that in which the faradic and galvanic currents are used, but there is a short account, quoted from another writer, of the condenser method. Dr. Massey also quotes an account, by another author, of the "progressive galvanic test." This is really a form of treatment in which denervated muscles are made to contract by a selective stimulus which does not cause simultaneous contraction of muscles with intact nerve-supply. In this account a wrong impression is given of the meaning of the term "chronaxic."

This book will be read with interest by those who are experienced in medical electricity, especially the section on the treatment of malignant growths. It is less suitable for the beginner as the descriptions given in certain parts, more particularly those dealing with physics and physiology, are insufficiently clear and not always free from mistakes. Thus in the account of the effects of the direct current on the tissues the beginner might confuse cataphoresis with migration of ions. Such expressions and statements as the "soapy ions of sodium and hydrogen," the "cations of water" (p. 41), Wallerian degeneration in "nerve endings or muscle," "the neuraxon may be said to curdle" (p. 167), "the negative polar surface receives a similar blast of nitrogen" (p. 133) are loose and unscientific. On p. 41 "catophoresis" and on p. 323 "sinusodial" are misprints. The book is well illustrated.

Diabetes.

A Diabetic Manual for the Mutual Use of Doctor and Patient. Third edition. By Elliott P. Joslin, M.D., Clinical Professor of Medicine, Harvard Medical School, Boston, U.S.A. Philadelphia and New York: Lea and Febiger. 1924. Pp. 211. $2.

> "To help make the home safe for the diabetic is the object of the book."

Prof. Joslin has set out plainly all that he thinks a patient should know about the cause and treatment of the disease. As his book occupies 203 pages (including the tables) it is obvious that he thinks that the patient should know a great deal. It is equally certain that if a doctor recommends a book to a patient he should learn its contents most carefully or he will not retain the patient's confidence. The volume should fulfil its purpose as the details are most carefully thought out. Very little is said about diabetic foods; Joslin says that those of his patients who have done best have either abstained altogether from their use or have only used a few varieties. Instructions as to the administration of insulin are clear and good; the things which the patient should know in order to save the doctor's time are very important. The food tables are very full, but are not arranged in the most convenient way as they are only given in percentages instead of in so much per ounce. The last-named practice is a great convenience for patients who only use the English weights.

Diabetes: its Treatment by Insulin and Diet. A Handbook for the Patient. By Orlando H. Petty, B.S., A.M., M.D., F.A.C.P., Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania. Philadelphia: F. A. Davis Company. 1924. Pp. 111. $1.50.

This little manual covers somewhat the same ground as Prof. Joslin's, but it is written in a less elaborate form and is suitable for patients with less education. Diabetes, above all other diseases, requires the intelligent coöperation of the patient, and books must be available for all grades. Here the greatest stress is laid on the minute details of managing the diet, weighing, and injecting insulin. The book will be of assistance as a guide to patients.

Nouveau Traité de Chirurgie.

Troisième édition. Fascicule XXIX.: Hernies. Par Maurice Patel, Professeur Agrégé à la Faculté de Médecine de Lyon. Paris: J. B. Baillière et Fils. 1924. Pp. 540. Fr.45.

A volume on a subject with which we are familiar, when it arrives from another country teaches us more than facts. We enter a new atmosphere where values differ from our own, and realise that even such a cosmopolitan subject as surgery may have a strong national bias, while we find that its methods and even its history may look quite different when seen through other eyes. Prof. Patel's book is not imposing in form and the absence of an effective index makes reference difficult. But none the less, it contains a large amount of useful information clearly arranged, and evidently represents the general teaching of the French school of surgery at the present day. The views expressed are eminently sound and practical, the pathology is clearly described, and certain suggestions made, for example, as to the origin of umbilical hernias, are of considerable interest.

It is discouraging to find almost no mention of English surgery; filigrees and darning are at least worthy of mention as resources in difficult cases. But a more painful blow is the description of the "English" truss, a contrivance which has disappeared even from instrument makers' catalogues. If, indeed, England is responsible for its invention we must plead it was more than a century ago. Workmen's compensation appears to have its difficulties in France, and there is an excellent discussion on the legal aspects of hernias. It is generally agreed that in not one case in a hundred is a hernia the real result of an accident, but the Cour de Cassation proved equal even to this difficulty and its finding on the subject is delightful. "Mais en admettant que le travail de Th. n'ait pas été la cause de la hernie, il en avait été du moins l'occasion." Apparently, if opportunity makes the thief, it also makes the hernia.

A Pædiatric Handbook.

Handbuch der Kinderheilkunde. Edited by Prof. M. von Pfaundler (Munich) and Prof. A. Schlossmann (Düsseldorf). In four volumes. Leipzig: F. C. W. Vogel. 1924. Vols. II. and III., pp. 700 each.

The second and third volumes of this monumental handbook are now published, and may well serve as a valuable mine of information to physicians specially interested in children's diseases in all lands. Opinions will naturally differ as to certain conclusions reached by the writers, but the general editorship is so good and the work is so typical of what is best in German industry that no one can fail to obtain great help by reference to such a work. The second volume deals with the infectious diseases, and is remarkable not only for the articles by Prof. B. Schick (Vienna).

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 13, 1924.

NEW REMEDIES.

FOR practitioners who began their medical careers a few decades ago the choice of drugs was practically limited to vegetable substances and chemical products, most of which had been prescribed in one form or another by their predecessors, sometimes through many generations. If some of these practitioners are of opinion that materia medica has been enlarged at too rapid a rate during the past quarter of a century, although the production of novelties was suspended in some directions during the war, their attitude is a quite reasonable one when it is based upon the feeling that mere novelty is not necessarily a recommendation. To-day inventiveness is again receiving full play in many chemical laboratories, and in the near future it is certain that many therapeutic substances which were unknown 30 years ago will claim employment in place of numerous drugs now usually employed. The inventiveness will require watching, and this was the notable lesson which emerged from the deliberations of the recent British Pharmaceutical Conference.

There is a law of economics that bad money drives good money out of circulation. We must take care lest this law apply itself to medicine. The Germans, before the war, were prominent in the art of inventing new drugs; in the huge laboratories on the Rhine hundreds of highly skilled chemists were engaged in the work of revolutionising therapeutics, and from the factories, of which these laboratories formed part, series upon series of new synthetic products were thrown on the world's markets, and it is commonly acknowledged that these German chemists rendered an inestimable service to medicine. It is known that the great anilin dye works on the Rhine exercised strict precautions before they introduced new substances to the medical profession; they utilised the means at their disposal for ensuring scientific accuracy and making clinical tests. We enjoy the results of their enterprise and research in series of products which are regularly prescribed by medical men everywhere. There are great British and American firms who work on similar lines and whose results are scrupulously checked by medical authority. There arise, of course, quacks and imitators, inside and outside Germany, whose inventiveness is restricted largely to nomenclature; selling the same thing under many names, they claim for their multiple-titled drugs virtues which the actual inventors of the substances never claim, and so help to bring into disrepute reputable goods. But having paid due respect to enterprise, we may ask the question whether it is desirable in the interests of medicine to be content with a situation which places us unreservedly in the hands of enterprising commercial houses, all of which are not equally supplied with medical information. In his presidential address to the British Pharmaceutical Conference, Mr. EDMUND WHITE said: "At the present time there is no public authority specially charged with the examination and standardisation of remedies by physiological or biological methods. There is no public laboratory where any firm or person inventing a new remedy can have such substances tried and examined, nor is there a laboratory where a pharmacist making his own preparations can have them examined by physiological methods to determine their potency." Our attention has been drawn to this position by a letter in the *Pharmaceutical Journal* from Dr. F. E. STEWART, who on previous occasions has advocated the organisation in America of some such institution as Mr. WHITE would have established.

Dr. STEWART's opinion is that a new remedy is not fitted for clinical test by physicians in hospital or private practice until "standardisation" by an official body is effected. Perhaps standardisation is hardly the *mot juste*, since it is at least doubtful if it would be possible in every case, but there is undoubtedly a great need for a central clearing-house for new medicinal substances. It is hardly fair to throw on business firms the enormous responsibility which some of them are more willing than able to shoulder. In the United States it has been suggested that new remedies should be manufactured under licence, and such a plan is now being put into practice there in connexion with the introduction of pneumococcus antibody solution under the professional control of the "Influenza Commission" set up by the Health Department of the United States Government. This is similar to the plan carried out by the University of Toronto for the manufacture of insulin, and schemes such as these are conceived on the right lines. But a more comprehensive system is needed to form a connecting link between the producers of new remedies and those who prescribe them, and such a scheme should include provision for the testing and recording of clinical experience. The grave professional difficulties arising here are clear to all our readers, but to some extent they should not be insuperable.

A CASE OF LATENT LEPROSY.

THE incubation period of leprosy has been a continual source of speculation for those who have studied this terrible disease. It has been recognised for some time past that the lepra bacillus may be dormant in the human body for a period of years; but it is from a study of those cases—and several have been recorded—which arise in countries where this disease is no longer endemic that the most accurate data are obtainable. Such a case has recently been seen in London in which a woman developed leprosy after an incubation period of eight years, but here the source of infection was easily ascertainable. The remarkable instance of extreme latency, reported by Sir NORMAN WALKER in our present issue, may well constitute a record. The incubation period in this instance must have been one of 40 years, for the patient, a Russian Jewess, had resided in Scotland for the whole of that period without exhibiting any evidences of the disease. The source of infection being unascertainable, it must be inferred that the organisms were present in her body the whole of that lengthy period. The last British leper of indigenous origin is known to have died in Shetland in 1798, and about the middle of last century an instance of a man contracting leprosy in Ireland was recorded by the late Sir HAWTREY BENSON. This man contracted the disease, as was made abundantly clear, by wearing the cast-off clothing of his brother who had died of leprosy.

The coloured plate which illustrates Sir NORMAN WALKER's article vividly portrays the improvement in the nodules which followed the treatment adopted. The leprosy bacillus, as is well known, has not yet been cultivated on artificial media, so that in preparing a vaccine recourse had to be made to a triturated

Diagnosis of Congenital Heart Disease in the New-born, including a Record of Cases of Fœtal Endocarditis and Mal-development. The writers remark that it is sometimes very difficult to differentiate between such widely different clinical states as (*a*) primary heart failure; (*b*) acute broncho-pneumonia without fever in a stage so early that heart failure seems improbable; (*c*) pulmonary atelectasis, where cyanosis and rapid breathing are the chief or only signs; (*d*) cerebral hæmorrhage, where cyanosis and rapid pulse and respiration predominate; (*e*) supra-renal hæmorrhage, where the same signs are present; (*f*) diaphragmatic hernia accompanied by cyanosis and periodic dyspnœa.—Dr. G. Kerr Cross makes a Report on Blood Transfusion Work Seen in the Hospital for Sick Children, Toronto, Canada. From Oct. 1st, 1922, to Sept. 30th, 1923, 394 simple transfusions and 122 exsanguination transfusions were carried out at this hospital. The indications for simple transfusion were (1) gross hæmorrhage, (2) anæmias of all kinds, (3) shock of all kinds, (4) as a preparation for operation in debilitated patients, (5) as a therapeutic measure in cases of marked debility. The results were excellent in anæmias, hæmorrhages, and debility, and of much greater service than intravenous injections of saline or gum acacia in shock. In post-operative conditions the method was a very valuable prophylactic against shock, considerably diminishing the mortality, especially in pyloric stenosis and intussusception. It also proved useful as a pre-operative measure. The indications for exsanguination transfusion were (1) septicæmias, such as erysipelas; (2) septicæmias suspected, but not proven; (3) intoxications, including the toxic stage of burns, acute intestinal intoxication of infants, and intoxication of human or unknown origin. Excellent results were obtained in erysipelas, and in toxæmia caused by burns exsanguination transfusion appeared to offer the only hope of recovery, while in acute intestinal toxæmia the mortality was reduced by half.—Dr. G. W. Ronaldson contributes a Note on "Spasmodic" Diphtheria, with two illustrative cases, showing that diphtheria may be complicated by spasmodic nervous symptoms, which are most likely to be found in persons with a nervous predisposition. These symptoms are rare, and it is doubtful if they ever occur in patients who have not suffered from diphtheritic angina. Further proof is needed before a diphtheritic origin can be assumed for such symptoms in subjects who have no characteristic symptoms of diphtheria.—Dr. Macdonald Critchley reports a case of Post-diphtheritic "Chorea," associated with the ordinary diphtheritic polyneuritis, and alludes to a similar case recorded by Globus.—Dr. J. M. Smellie describes three cases of Congenital Duodenal Occlusion. Two died within a few days of birth, which is the almost invariable rule, and the third survived for nearly three months. The site of the occlusion in one case was just below the opening of the common bile-duct, of which type there are about 23 recorded cases. In the second case the duodeno-jejunal flexure was the site, of which type about 11 examples have been observed. In the third case the occlusion occurred just above the opening of the common bile-duct, but there was also a complete interruption in the continuity of the gut, and the second part of the duodenum appeared to arise from the junction of the common bile-duct and pancreatic duct. No previous example of this variety seems to have been reported.—Dr. F. Parkes Weber writes on Developmental Telangiectatic Hæmorrhage and So-called "Telangiectasia"—Familial and Non-familial, which includes telangiectatic epistaxis, hæmoptysis, hæmaturia, hæmatemesis, and bleeding from the rectum.—Dr. Parkes Weber also contributes a paper entitled a Law Regarding the Distribution of the Depigmented (Leucodermic) Patches of Vitiligo when they are added to Mole-like Nævi.—In a paper on Acute Appendicitis in Children: 120 Consecutive Cases, Mr. W. A. Thompson, of Liverpool, discusses the diagnosis and treatment of this condition with details of his cases in tabular form.—Dr. W. G. Wyllie records a case of Amyotonia Congenita in a girl aged 4½, who had been kept under observation for three years, during which gradual improvement had taken place.—The abstracts from current literature are devoted to acute infectious diseases.

NEW INCOME-TAX PROVISIONS.

The Finance Act, which has just come into force, contains a number of interesting provisions, the general effect of which is to lighten the burden upon the taxpayer in respect of certain classes or categories. So far as the changes concern medical men the saving will arise, not qua medical men, but as members of the taxpaying community in the following ways:—

1. The rate of tax remains at 4*s.* 6*d.* (reduced rate 2*s.* 3*d.*).

2. Inhabited house duty is wholly repealed, and this somewhat irritating impost will not again appear on the demand notes issued on the first day of each year.

3. The allowance of £45 given in respect of persons taking charge of widowers' and widows' children, or acting as housekeepers, and in respect of widowed mothers, &c., has been increased to £60. This concession is the result of some years of persistent endeavour to place the allowance on a more generous basis.

4. The allowance given to widowers or widows in respect of housekeepers may now be claimed irrespective of the handicapping condition formerly existing—viz., that there must be a child looked after by the housekeeper in respect of whom the child allowance had been given.

5. Where a taxpayer derives income from foreign possessions he now is entitled to ask for an adjustment of such income to the actual total amount of the first three years of assessment. Previously assessments could be made on the basis of that applicable to trades, professions, and vocations, without the adjustment to which the latter were entitled. This provision, therefore, merely places on the same basis the liability to tax.

6. In case it may be desired to retire to some country where taxation is less burdensome, it is fairly well known that one must cease to maintain a residence in this country. There are questions constantly arising, however, as to whether a person suffering tax may be regarded as residing or domiciled abroad, but in the past difficulties have arisen in appealing from the decision of the Board of Inland Revenue. It is now proposed, therefore, to give the taxpayer a right of appeal, on questions of domicile, ordinary residence and residence, to the Special Commissioners, from whom further appeal may be made to the High Court.

7. Repayment of income-tax is now to be made at the standard rate of tax for the year or at half that rate as the case may be. Where, however, a person proves that, by reason of the deductions to which he is entitled, he has no taxable income, repayment will be made of the whole of the tax paid or suffered by him.

8. A collector of taxes is now empowered to recover summarily amounts of tax under £50, which presumably means that more cases of arrears will appear in the limelight than in the past.

9. The recipients of dividends have often been mystified by the "explanatory" hieroglyphics preceding the net rate of payment per share on dividend warrants. This difficulty is now to be remedied, and after Nov. 30th next dividend warrants must show the gross and net amounts and the rate and amount of tax deducted.

tional to the diminution of the ratio, and are accompanied at the same time by a diminution of carbon dioxide. If the ratio is increased to, say, 18 to 1 the excess of air damps the explosion in the cylinder and the flame of the explosion does not spread throughout the cylinder with a result that unburnt petrol appears in the exhaust gas. Probably, also, if the ratio is lessened to an extreme extent petrol may appear in the exhaust gas. It is, therefore, conceivably possible, dealing only with the subject of exhaust gas, that death of an individual may be caused by (1) petrol fumes, (2) carbon monoxide (carbonic oxide), or (3) a mixture of the two conditions. The first possibility is an uncommon one owing to the rapid dilution of the vapours with the surrounding air and the relatively small percentage of petrol in the exhaust gas. Further, the running of an engine under such conditions is likely to damage seriously the working parts. In the second case it is easy to see that a comparatively small alteration in the proportions of air and petrol will lead to the production of CO in proportion to the ratio of air to petrol. According to Haldane the presence of 0·05 per cent. of CO in the atmosphere will produce distinct toxic symptoms, 0·2 per cent. will produce urgent symptoms, and 1 per cent. is usually regarded as a possible fatal mixture. As the exhaust gas may contain as much as 11·6 per cent. of CO, it is not surprising that anyone remaining in a closed garage may easily succumb to poisoning from CO.

Analysis of Exhaust Gas of a 20 h.p. Daimler Four-cylinder Engine.

Petrol consumption per 1000 revolutions in lbs.		0·181	0·191	0·197	0·217	0·250	0·293
Brake load at 43 inches radius in lbs.		25·0	27·5	29·3	29·4	29·3	27·0
Measured amounts of the exhaust gas reckoned as per cent. of the volume of dry exhaust gas ..	CO_2	10·9	12·8	13·5	10·6	9·6	6·0
	CO	Nil.	Nil.	0·7	5·0	6·25	11·6
	O	3·6	1·5	0·2	Nil.	Nil.	Nil.
	H	Nil.	Nil.	Nil.	2·1	2·65	8·7
	N	84·0	84·0	84·0	81·0	80·0	73·0
Total O as obtained by dividing N by 3·76 as per cent.		22·4	22·4	22·4	21·5	21·3	19·4
Steam as per cent. calculated		15·8	16·2	16·8	16·8	17·2	15·2

CO_2 = carbon dioxide. CO = carbon monoxide. O = oxygen. H = hydrogen. N = nitrogen.

In THE LANCET [2] references to cases of poisoning by exhaust gases have been given, and the various writers are by no means in agreement as to the cause of death. In one series of 42 cases described by Dr. G. W. Johnson in Canada, he is of opinion that petrol fumes were the cause of death and not CO, and he quotes spectroscopic examination of the blood and animal experiment in support of his statements. However, whilst not being able to exclude poisoning by petrol or by decomposition products other than CO, it seems to be impossible to exclude CO at all events as a partial factor in these cases. The examination of the blood spectroscopically in these cases for CO is of great value when a positive result is obtained, but "death may occur before the hæmoglobin becomes sufficiently charged with CO as to afford spectroscopic evidence of its presence,"[3] chiefly owing to the masking of the CO bands by oxyhæmoglobin and reduced hæmoglobin. The post-mortem appearance of the internal organs is usually characteristic, as also their resistance to putrefaction, but in some cases where death occurs rapidly, or where the patient has lived some days after exposure to CO, the post-mortem appearances are so indefinite that a certain diagnosis of CO poisoning at post-mortem becomes impossible.

In the article by Drs. Blacklock and Peacock it seems probable that the lethal effect of the exhaust gas was due to CO. It is a little unfortunate that no detailed account of the symptoms displayed by the rats is given and that no details of post-mortem examinations on the rats are available. The fact that the rats were not driven out of the drain is suggestive of CO poisoning, as, of course, this gas is odourless and tasteless and not in any way irritant. Again, when the motor-launch was used the exhaust gas was mixed with water and no impairment of the lethal effect was noticed. Under such conditions many substances, such as petrol vapour, would be removed by the water, but CO being only slightly soluble in water would be discharged in the exhaust gas unchanged. Nevertheless, it is conceivable that some decomposition product of petrol and air other than CO may be concerned, but no suggestion of any such compound is mentioned in the treatises on internal combustion engines with the exception of minute traces of aldehydes. If the effects on rats were really brought about by CO, the internal combustion engine appears to be a rather inefficient and uneconomic source of CO, if any other is available.

Annotations.

"Ne quid nimis."

MEAT INSPECTION IN SCOTLAND.

ADEQUATE supervision of meat intended for human consumption is a subject upon which public health authorities have for years concentrated much criticism, but without obtaining any advance in procedure. All recognise that present conditions in England are supremely unsatisfactory, involving great inequalities and great injustices. In some areas keen and efficient supervision is exercised, in others there is hardly any supervision. This is bad alike for the public, the meat industry, and the local authorities. In the United Kingdom, Scotland has led the way in establishing a system of uniformity of inspection and judgment. These are dealt with in the Public Health (Meat) Regulations (Scotland), 1924. Dr. Gerald Leighton has recently published a useful handbook,[1] mainly intended for meat inspectors and others officially concerned, as a guide and explanation of these regulations. The essential principles adopted are worthy of study. Two classes of inspection officer are recognised—meat inspectors and detention officers. A meat inspector is no longer to be any person who is entrusted with the duty of inspecting meat, irrespective of his competency, but one who possesses certain definite qualifications. As defined, it includes the medical officer of health of the district, or a veterinary surgeon, or a person who has received special training in the work of meat inspection, and, prior to June 1st. 1923, has had not less than seven years' practical experience in this work and has obtained from the Scottish Board of Health a certificate of qualification. The "detention officer" is an innovation, and is any person possessing certain qualifications who is appointed by the local authority for this purpose. The qualifications required are such experience and training as the meat inspector of the district may consider necessary to enable him to recognise any departure from the normal in the carcass, organs, or viscera of an animal. His duty is to detain, and neither to seize nor condemn. These powers rest with the meat inspector, who must be trained, and as Dr. Leighton remarks, the new regulation "cuts out once and for all the placing in the hands of utterly incompetent persons the important duty of inspecting meat."

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[2] THE LANCET, April 5th, 1913; Jan. 27th, 1917; Oct. 12th, 1918; June 19th, 1920.

[3] Dixon Mann: Forensic Medicine and Toxicology.

[1] Pocket Handbook of Meat Inspection: A Guide to the Public Health (Meat) Regulations (Scotland), 1924. By Gerald Leighton, M.D., F.R.S.E., Medical Officer (Foods) Scottish Board of Health. London and Edinburgh: William Hodge and Co., Ltd. 1924. Pp. 126. 6s.

nodule which had been excised. The emulsion was heated to 60° C. for half an hour and diluted with carbol saline, which was injected in the doses of 1 c.cm. weekly, containing approximately 200 million leprosy bacilli. The difficulty in assessing at its true value the effect of any particular treatment in a given case of nodular leprosy is very great. Partial resolution of the nodules has been claimed as the result of many different forms of treatment. Similar success has been recorded with chaulmoogra, with its salts, the gynocardates and hydnocarpates of soda, by Deycke with nastin—a vaccine prepared from a streptothrix grown from leprotic nodules—and with injections of antimony. Caution is necessary, for Dr. E. Muir and others have shown that at certain periods the leprotic process may become stationary and that under appropriate hygienic and dietetic conditions the disease may be ameliorated in a remarkable manner, at any rate for a time.

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LONDON WATER.

The eighteenth annual report[1] of the Metropolitan Water Board contains the results of the chemical and bacteriological examination of the London waters for the 12 months ended March 31st, 1924. As in previous years, Sir Alexander Houston begins by setting out how the immense task of providing nearly seven million persons with water fit to drink is carried out with such apparent ease and regularity. This year he indulges in a little legitimate boasting in view of the vast army of strangers who are visiting the British Empire Exhibition at Wembley without anxiety as to their supply of drinking water; he infers that there is no other large populated centre in the world which can afford the same amenities. The Director of Water Examination does not let his readers take for granted everything that has appeared in previous reports, and he asks this year the rhetorical question: Why is it necessary to purify water at all?—in order to set out again some of the reasons, physical, sentimental, and hygienic, which determine the answer. Although, as he says, many people have an almost invincible repugnance to the addition of any chemical to water destined to be used for drinking purposes, yet medication has now become an accepted practice, whether as lime for softening or hardening waters, alum for clarification, oxidising filters for removal of iron, permanganate for taste, copper sulphate to kill algæ, and so forth. In an interesting section he foreshadows the possible addition to London water of the modicum of iodine required to prevent the development of goitre, recalling Dr. C. N. Atlee's recent observation that 34 out of 895 unselected boys under the age of 12 in a south-eastern quarter of London had thyroid enlargement and 43 out of 944 girls, respectively 3·8 and 4·5 per cent. of children examined. The prophylactic experiment, carried out at Rochester, U.S.A., of artificially iodising the water-supply twice a year for a period of about two or three weeks, opens up a vista of possibilities of conveying to consumers in their water-supply substances of preventive or curative nature. The experiment costs Rochester only £357 a year on a daily consumption of some millions of gallons. To think of a water-supply in the light of a preventive of disease is a new and attractive idea.

Water-borne infectious disease is still a very complex question. Generally speaking, Sir Alexander Houston writes, it is very hard to associate typhoid fever causatively with water-supply in this country. Despite laborious effort, he has failed to isolate the typhoid bacillus from sewage or from impure river water before purification. Indirectly, he has arrived at the rough-and-ready rule that any volume whatever of any water-supply, which contains no more than 704 excremental bacteria, can reasonably be supposed not to harbour the typhoid bacillus in that volume; and he goes on to consider the question of the number of bacilli necessary to start an infective process. Theoretically, of course, one may suffice, but, even should typhoid bacilli be present in a water-supply, infection would not necessarily result so long as they do not occur in clumps or masses, but are so few and evenly distributed that no single draught of water can contain more than a single germ. Unfortunately, however, waters showing no gross signs of bacterial pollution, as judged by ordinary standards, have been the means of causing widespread disease. There is only one safe course to adopt—namely, to regard as anathema all adventitious water entering a supply during and after purification. Once having entered the custody of a water-works authority, water should be regarded as sacred until it has reached the consumer in a condition of proven safety. An unexpected attack on London water has recently been made by the sea-gull, which seems to be changing its habits and to be finding land waters more attractive than the seashore. Photographs reproduced in the report show a hundred or more gulls flying over a single filter, and although, so far as is known, gulls do not suffer from the water-borne diseases which afflict human beings, their droppings produce an excremental pollution which cannot at present be differentiated from contamination of human origin. The Board's engineering department has recently organised a system of frightening away the birds by frequent firing of blank cartridges, but apparently the sea-gull must be reckoned with as a permanent invader of the solitude of reservoirs which have hitherto been the nesting-ground of such comparatively rare birds as the great crested grebe. The report is both learned and entertaining, and contains matters with which every citizen of Greater London should be familiar. In octavo form at a third the price it might obtain the readers it deserves, though we can see that the production was costly.

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TOXIC EFFECTS OF EXHAUST GAS.

In the current number of The Lancet is a paper by Dr. D. B. Blacklock and Dr. W. H. Peacock on the destruction of wild rats by means of the exhaust gas of the petrol engine. In the *Times* of July 9th, 1924, a verdict of death by misadventure was recorded by a coroner on a man who was found dead on the floor of a garage close to the exhaust outlet of a motor-car. The engine was running. The composition of exhaust gas of internal combustion engines is therefore important, and the analysis made by Hopkinson and Morse at Cambridge given in the table, shows that the efficiency of the engine as indicated by the brake load did not vary very much with the varying amounts of petrol used. The analysis of the exhaust gas varied considerably. According to Judge[1] the mixture which gives the nearest resemblance to perfect combustion—i.e., complete oxidation of all the carbon and hydrogen of the petrol—is 14·75 parts of air to 1 part of petrol, and even then traces of carbon monoxide are formed. Such proportions probably occurred under the conditions given in column 2 of the table. If the ratio is lessened to, say, 12 or 10 parts of air to 1 of petrol, combustion is incomplete and CO and H make their appearance in quantities proporbouring sculptures representing women, suggests to the anatomist that the human figure has vastly changed since her remote epoch, but the sculptured men on either side of her at once belie this supposition, for they are tall, symmetrical, despite the rudeness of their representation, and one at least is surmounted with a finely developed skull. It is conceivable that the men represented in the Laussel sculpture were invaders who, like the earliest Saxon and Danish invaders in England, brought none of their womenkind with them and were compelled to fight each other for the cave-women of Neanderthal type.

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[1] London: P. S. King and Son, Ltd., 2, Great Smith-street, Westminster. 15s.

[1] High Speed Internal Combustion Engines, 1916.

AIR EMBOLISM IN OBSTETRICS.

IN a paper read before the Chicago Gynecological Society, Dr. James A. Gough,[1] who reports an illustrative case, remarks that the significance of air embolism in obstetrics was first recognised in 1829 by Legallois, who suggested that the entrance of air into the uterine veins might be a source of danger in recently delivered women. Since then many cases have been reported, but the extreme infrequency of the condition is shown by the fact that Opitz never had a case among 4500 deliveries. As many of the recorded cases of supposed gas embolism were published before the dawn of the bacteriological era, it is reasonable to suppose that a certain proportion of them were of microbic origin. Welch and Flexner in 1896 studied several cases in which the presence of gas at the autopsy had been considered evidence of air embolism, but which they demonstrated were due to the agency of gas-producing organisms. Dr. Gough's case was that of a II.-para, aged 25, in whom episiotomy was performed under light ether anæsthesia. Collapse took place immediately after the operation, and death occurred seven hours after delivery, respiratory failure and deep cyanosis preceding cessation of the heart's action. The necropsy, which was made nine hours after death, showed that the right ventricle was markedly dilated and had flabby walls which appeared transparent. When opened under water the right ventricle was found to contain much free air, and frothy blood also escaped from it. Frothy blood was also found in the pulmonary artery, but the blood elsewhere did not contain air, and there were no signs of post-mortem decomposition. On histological examination there was no evidence of gas bacillus infection, and examination of the blood showed no bacteria. The case therefore appeared to be a genuine example of air embolism following delivery.

MEDICAL INCUNABULA.

EARLY printed books have evoked greater interest of late years among collectors of historic medical literature than at any previous period. In a recent sale at Messrs. Sotheby's as many as 50 early printed works on medicine and surgery were put up to auction, and some of these will doubtless soon reappear on the shelves of the booksellers. In Catalogue 22, issued by the International Antiquariaat of Amsterdam (Menno Hertzberger), we find nine incunabula offered for sale, to each of which an interesting bibliographical history attaches. Conspicuous among these nine is the Celsus published by Pachol and Scinzenzeler at Milan in 1481. This, the second edition, is considerably rarer than the first. The book was apparently not seen by Hain or Proctor, those indefatigable bibliographers, but was known in 1764 to De Bure, who speaks of it as "encore rare et recherchée des curieux" in his "Bibliographie Instructive." He catalogues also at great length the first edition of Celsus, pointing out that his predecessors have been in the habit of dating it 1475 instead of 1478, owing to their not having looked closely enough at the curiously printed year of publication in the colophon or end-title. De Bure, one of a family of Paris booksellers who became famous for their catalogues of the libraries of a learned period, claims to have put on record the greater part of the books issued in the republic of letters since the invention of printing, but he only mentions some 14 medical incunabula. And this proves that bibliography, and, by inference, collecting had not progressed far in his day. Ideas as to value are relative. He, for instance, considers the first edition of Celsus to be *fort rare*. The present age, with its far larger outlook on the republic of letters, has decided in favour of the second. The beautiful, tall, clean, and unwashed copy, now on sale at the International Antiquariaat, is offered for 450 guilders.

In the same catalogue among the nine medical incunabula we note Hartmann Schedels's "Liber Chronicarum," printed at Nuremburg by Anth. Koberger in 1493. It is a folio with clasps, and besides being considered the crown of mediæval craftsmanship in bookbinding, is illustrated with more than 1800 fine woodcuts by the teachers of Dürer—namely, Wohlgemut and Pleydenwurff. A number of famous medical authors from Alexander to Trusianus are mentioned in its pages, and there are references to the finding of the body of a giant, to *lues* on a great scale, to a monster in Gascony, to the names of known human monsters, to a chicken with four legs in France, and to the Seven Sleepers of Christendom. This fine copy with large margins is in the original calf binding with clasps, and contains the three blank pages and the discourse on Sarmatia usually missing. The price is 650 guilders. Book illustrations of the Dürer school are always admirable, and when the subject is medical, as when baths, hospitals, operations, and anatomy lessons are depicted, they are often of great historic value. Some of the best ancient medical woodcuts adorn title-pages, and would appear to have a mystical significance. In these title-pages vignettes illustrative of medical life are often to be found, and deserve detailed study. A catalogue of more than 150 such title-pages has been prepared at the library of the Royal College of Surgeons of England.

ADRENALIN AS AN ANALGESIC.

IN a comprehensive, even discursive, article[1] Dr. D. Paulian, of Bucharest, discusses the action of anæsthetics in general, and of adrenalin in particular. Such drugs as antipyrin, salicylates, and morphine, on the evolution of a common cold he suggests act like sleep, reducing the phenomena of inflammation, for the time being at any rate, by diminishing the conductivity of the sensory nerves. It has been argued that salicylates are effective in certain diseases, mainly because they block impulses which, in their absence, would travel by the sensory nerves to the central nervous system. Indeed, it has been shown that aspirin and atophan are antifebrile simply because they reduce the excitability of the central nervous system. At Prof. Marinesco's hospital in Bucharest Dr. Paulian has been investigating the action of adrenalin on the gastric crises of tabes. Of its ability to mitigate these crises and relieve the lightning pains of tabes there could be no doubt; of its mode of action it was difficult to be certain, but Dr. Paulian considers as plausible the hypothesis that the favourable effect of adrenalin depends in such cases on a rise of blood pressure. He has found that in all cases of tabes associated with disease of the aorta the arterial pressure is below normal, and this hypotension is exaggerated during gastric crises and attacks of lightning pain. He has noticed that the relief obtained by an injection of adrenalin during a gastric crisis is accompanied by an appreciable rise of the blood pressure, and he is inclined to think that the best explanation of the asthenia of tabes is to be sought in its concomitant hypotension. Whatever the explanation, it seems clear that adrenalin is a rapid and effective remedy for gastric crises, and though it is most potent when given by subcutaneous injection, it is not absolutely inert when given by the mouth. One of Dr. Paulian's

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[1] Surgery, Gynecology, and Obstetrics, July, 1924.

[1] Paris Médical, August 9th, 1924.

As regards public abattoirs detailed records have to be kept; the actual form of record is not specified, but they must be such as are approved by the central authority. Private slaughter-houses have to be licensed every year. The control over killing in these private slaughter-houses is effected by granting the licence with conditions that slaughtering shall only be carried out on specified days and at specified hours. This condition has frequently been stressed by medical officers of health as the only practicable way to supervise meat in private slaughter-houses. Killing at other times is only permissible on giving special notice, with a clause excluding from the condition immediate slaughter necessitated by accident or illness. The dangerous possibilities of this concession dealing with emergency slaughter are guarded against by regulations requiring prompt notice to be given to the clerk of the local authority and by making it the duty of the meat inspector or detention officer to inspect within 24 hours. The owner has to preserve the carcass and organs undetached for this period if necessary. The rather vexed question of meat stamping is also dealt with and a compromise is effected; stamping is not made compulsory, but local authorities are authorised to stamp meat, subject to the approval of the Scottish Board of Health.

The control over the preparation, storage, and sale of made meat products, such as brawn, sausages, and the like, is, perhaps, outside the scope of the regulations, but is not entirely neglected. These foods are included in the definition of "meat food product," and one regulation requires that meat or meat food products must not be stored in any premises that are not kept in a clean and sanitary condition. The regulations do not appear, however, to include any conditions governing the preparation and supervision over these meat food products. At present such regulations are badly needed. Another regulation of interest is one which requires that every local authority shall keep a register of all cold stores within their district, the register to include the recording of a number of essential details. The extremely important subject of uniformity of inspection and of the pathological conditions which justify seizure is dealt with by setting out such conditions in detail in the first schedule. Dr. Leighton remarks that it occupies only about five pages of print, but that "in those five pages is included the whole duty of an inspector of meat." It is evident that these directions have been compiled with great care and by men of practical experience. As an illustration the conditions which justify seizure of the whole animal, or only specified parts, in cases of tuberculosis are set out with great clearness.

No one can study the regulations without appreciation of the thorough way in which the subject has been investigated, with careful anticipation of practical difficulties. Dr. Leighton has added to the debt by his succinct discussion of the meaning and objects of the regulations which constitute a public health reform of great value. He points out that an important factor in their initiation and practicability is the fact that over 90 per cent. of the total consumption of home-killed meat in Scotland is dealt with in public abattoirs. There seem no insuperable reasons why similar regulations should not be adopted in England, but it would appear that the scientific administrative procedure could not be initiated without new legislation. For example, that hoary anachronism, the "registered" slaughter-house, usually including the worst slaughter-houses in the area, stands on the authority of an Act of Parliament. The simple solution of allowing slaughtering only at prescribed times as a condition of licensing cannot prevail for these slaughter-houses since no licensing is required. Most of the bad meat trade centres in the rural areas and it is in these that powers to regulate are so deficient. It is of limited value to adopt a uniform standard of judgment for meat unless also a better administrative machine is evolved for English conditions. The Scottish machinery provides an admirable example.

THE PROGRESS OF MAN.

ANOTHER volume in a series of little books entitled "Today and Tomorrow" has appeared in sequence to Mr. J. B. S. Haldane's "Dædalus" and Mr. Bertrand Russell's "Icarus," the former of which purported to expose the promises of science, especially of biography, while the latter dwelt upon the sinister possibilities which accompany scientific developments, threatening to make of man's new wisdom an engine destructive to man. "Tantalus"[1] is intended to provide an antidote to much learned pessimism, but Dr. Schiller starts gloomily enough with the premise that man has always in the course of his ascertained history been placed in the dilemma that as fast as his ingenuity might bring him nearer happiness his failings perverted the knowledge before his virtues allowed him to employ it rightly. The happier message of "Tantalus" is that, given time in which its effects can work, we have in the science of eugenics an escape from the impasse. And the leaders of this science must accustom themselves, we gather, to look steadily backwards as well as forwards, man having ceased, biologically speaking, to be a progressive species. The argument here relies on the magnificent physique of the Cro-Magnon people of the Aurignacian Age, and as to this we have remarkable contemporary evidence. Truth in the sense of accurate portrayal of what is observed by eye was well known to primitive man, whose sense of beauty was, however, not ours. But their sense of truth was as keen as our own. This is apparent to all those who have examined prehistoric sculpture and cave-painting in the Abri de Laussel in Dordogne or in the caves of Spain. Early man was an accurate reproducer of what we should consider to-day execrable human models, but there is a probability that he admired what he reproduced.

The cave of Laussel was first examined in 1908 by M. Gaston Lalanne, who described his discoveries in *L'Anthropologie* in 1912, with reproductions of the rude sculptures of the Upper Aurignacian epoch of from 25,000 to 40,000 years before the advent of historic civilisation. These sculptures chiefly represent nude female figures of the steatopygous type found among lowly African races. Every feature of the female figure is here depraved to modern civilised thinking. The breasts are enormous and pendant, the hips extraordinarily wide, the abdomen superficially vast, the whole figure stunted. In strange contrast to these almost infra-human types there was found on one wall the figure of a tall and well-formed man. Lalanne was of opinion that the man was an archer in the act of drawing a bow, but certain details in the bas-relief have lately led to different conclusions. These are well set out by Prof. Dr. P. Shiefferdecker, of Bonn, in an article entitled "Ueber ein Bildwerk aus der Urzeit," contributed by him to Vol. II. of the "Libro en Honor de D. S. Ramón y Cajal," published by the admirers of the famous Spanish surgeon and man of science. Taking the figure of the supposed archer as his theme, Schiefferdecker shows that this tall man is one of a group of three who are engaged in the kind of contention of which the prime example in history is the Rape of the Sabines. There are two tall men, and they are fighting at the mouth of a small cave for the possession of one small woman; the archer is curving his arm round her diminutive figure, protecting or withdrawing her from the other man. The men are manifestly beings of a larger race than the woman, and it is conjectured that they are specimens of that gigantic Cro-Magnon race, which in brain-capacity and stature so surpassed any subsequent Europeans. The crouching, cowering woman, on the other hand, is conjectured to be a surviving Neanderthalian, one of that ape-like tribe that possessed Europe prior to the arrival on the ethnologic scene of the Cro-Magnons. These races are believed to have overlapped, and both to have disappeared as a whole, but to have left traces in our physical make-up. The female figure, taken in conjunction with neighdiameter of the pencil of X rays. These leave in the direction of the axis through the glass window (1) in the base of the tube. An unevenness of the tungsten spiral thus has no unfavourable effect, while the luminous wire is so thin as scarcely to intercept any rays from the anticathode, and no shadow from the wire is cast on the plate. The three insulating layers of the cylinder are shown: chrome iron (9), lead (10), copper (11), while (8) is a glass tube which isolates the anticathode from the cathode. Cooling takes place by filling the space (13) with water. Experiments have been made with tubes of similar type for deep therapy and are likely soon to be placed on the market. It is clear to us that this Dutch tube presents features not possessed by other tubes. It contains its own device for protecting the operator from extraneous rays, the wall of the tube is practically impervious to the rays, and only those which are used pass out. The shape of the tube allows readier approximation to the body, especially in the less accessible regions, while the earthing of the cathode renders it safe for the patient or operator to touch the tube without risk when it is being worked. Radiologists would certainly do well to examine this tube for themselves.

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[1] Tantalus. By F. C. S. Schiller, M.A., D.Sc. 1924. Kegan Paul. Pp. 72. 2s. 6d.

AN EASTERN CLAN.

THE Palaungs are a tribe living in the district of Tawnpeng, which lies in the Shan States about longitude 97° E. and around the twenty-third parallel of N. lat. They are a little-known race and untouched by Western ideas, and as Mrs. Leslie Milne says in the introduction to her book entitled "The Home of an Eastern Clan: A Study of the Palaungs of the Shan States"[1]: "The East is changing so rapidly . . . that the customs of a people off the beaten track and as yet uninfluenced by contact with the West, are, I think, worth preserving." A vast amount of information about their psychology, religion, and social customs has been collected and arranged by Mrs. Milne. Her first task was naturally to learn the language, and she gives an amusing account of her difficulties. For instance, she had collected the Palaung words for "walk" and "run," "sit" and "stand," but not for "jump." So she jumped over a stick on the floor, and then down off a box. All the Palaungs present shouted "ru," which word she put down in her note-book as meaning "jump." But when she revised her notes with an interpreter she discovered that "ru" really meant "mad." Chapter XII. is devoted to medicine, charms, and omens. The religion of the Palaungs is Buddhist, but tinctured with much survival of spirit worship, and nearly all the ills of life are considered as due to evil spirits. Hence, treatment is mainly a matter of propitiating the evil spirit in question, though, in addition, sundry medicinal plants or animals, and minerals such as lime or wood ashes—i.e., potash—are used. The chapter on spirit worship is particularly interesting, and together with the portion of the book dealing with folk tales is one more proof of how popular beliefs are the same all over the world. On p. 352 is a story of possession by a "pok," which is a spirit living in a graveyard. Can it be that this name is the same as "Puck" or the Welsh name for a fairy—i.e., "pwci"? The story is that of an old woman who died, and after her death her children dressed her body in the habit of a Buddhist nun. Next day, while she lay in her coffin, knockings were heard, and the bystanders on opening the coffin found her apparently alive. She was helped out, set by the fire and given food, which she ate voraciously. She could not speak but only made strange sounds. A year passed and then a monk came to the relatives saying that the revived body was not really their mother, but only the dead body animated by a "pok." He gave them certain directions and on these being carried out the "pok" fled away, leaving only a loathsome corpse apparently dead a year. Let the reader compare this tale with that masterpiece of Stevenson, "Thrawn Janet," and note the curious resemblances. Both bodies after death animated by an evil spirit; both of them unable to speak intelligibly, and both freed from the spirit by the ministrations of a minister of religion. Not anthropologists alone, but all who are interested in the Empire to which they belong ought to be grateful to Mrs. Milne for this book.

BISMUTH IN EXPERIMENTAL SYPHILIS.

Ehrlich's successor, Prof. W. Kolle, has published an account[1] of the prophylactic use of arsenical preparations, mercury and bismuth, in experimental syphilis, and his observations in the case of the last-named drug are instructive. He anticipated that bismuth would not be more effective than mercury in rendering experimental animals resistant to infection, but to his surprise he found that mercury had only a transitory effect in this respect. When, however, he injected insoluble salts of bismuth which were retained in the body as depôts at the site of injection, it proved impossible to inoculate with syphilis successfully. In the case of 26 rabbits given an intramuscular injection of bismuth, followed by intra-testicular inoculations of spirochætes from two to fifteen weeks later, there was not a single instance of a chancre developing. X ray examinations showed that these insoluble salts of bismuth, including the carbonate which is quite insoluble in water, could remain for months embedded in the muscles into which they had been injected. Control tests carried out with 68 animals which had not been given preliminary treatment with bismuth showed that 94 per cent. of them developed a chancre at the site of inoculation. In another series of controls, where the animals had been treated with easily absorbed preparations of bismuth, refractoriness to infection was in most cases short-lived. The upshot of these observations would seem to be that a single bismuth "stopping" left in the body is capable of rendering it refractory to infection with syphilis for as long as four months. Prof. Kolle sounds a warning with regard to drawing hasty conclusions as to the applicability of his observations to man. It must first be shown that the bismuth-treated rabbits did not contract experimental syphilis in some latent guise which dispensed with a chancre at the site of inoculation. For, as in the case of prophylactic treatment with arsenical preparations, it is conceivable that resistance to infection may be acquired only up to a degree which does not exclude the development of an abortive form of syphilis. It is also, as Prof. Kolle points out, desirable that his experiments on rabbits should be repeated on monkeys, and that they should react in the same way before general conclusions are drawn as to the prophylactic value of bismuth. If man reacts like the rabbit in this matter to bismuth, it is obvious that a very important advance has been made toward the prophylaxis of syphilis in man.

WE regret to record the death at Bournemouth, on Sept. 6th, of Sir Frederick Needham, Commissioner of the Board of Control, aged 88 years.

THE death occurred on Sept. 9th of Dr. Robert James Farman, secretary of the Panel and Local Medical Committees of the County of London.

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[1] Oxford: At the Clarendon Press. 1924. Pp. 428. 16s.

[1] Deut. med. Woch., August 8th, 1924.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—The distribution of prizes to the students will take place in the out-patients' hall of the hospital on Oct. 1st, at 3.30 P.M., by Sir Humphry Rolleston. Dr. W. Cecil Bosanquet, senior physician to the hospital, will be in the chair.

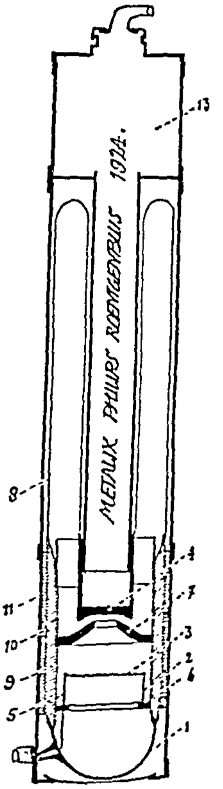
DIPLOMA IN PUBLIC HEALTH.—A course of lectures and demonstrations under the Metropolitan Asylums Board, dealing with hospital administration, will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., by Dr. E. W. Goodall on Mondays and Thursdays at 4.30 P.M. and alternate Saturdays at 10.30 A.M., beginning Thursday, Oct. 2nd, for a period of three months.

patients was an army officer who used to be aroused at 5 o'clock every morning by an irresistible desire to go to stool. He was able to abort these attacks as soon as they began by swallowing 10 drops of adrenalin. In neuralgia of the sciatic nerve and in rheumatic affections of the joints adrenalin has been found remarkably efficacious, even when the rheumatism has been complicated by effusions into joints. It may be that adrenalin is beneficial in tabes because the action of the suprarenals is defective; such an hypothesis would explain the general weakness and many of the other symptoms of tabes. Whatever the mechanism of adrenalin artificially introduced into the body may be, there can be no doubt as to the analgesia and euphoria which it creates, and in this respect it assuredly deserves more attention than it has hitherto received from physiologists and physicians.

PREGNANCY AND PULMONARY TUBERCULOSIS.

AT the fourth meeting of the International Union against Tuberculosis held in July at Lausanne, interesting discussions centred around a paper read by Prof. Calmette on the possibility of virulent tubercle bacilli being evolved from avirulent germs, a paper by Prof. Sahli on the defences of the organism against the tubercle bacillus, a paper by Prof. H. Forssner on the relation of pregnancy to tuberculosis, a paper by Prof. L. Bernard on the prevention of tuberculosis in infancy, and a paper by Sir Robert Philip on the decline in the tuberculosis mortality resulting from the organisation of tuberculosis campaigns in different countries. The International Union against Tuberculosis has its headquarters in Paris at the office of the League of Red Cross Societies, which also houses the secretariat of two other international societies combating venereal disease and cancer respectively. It would be difficult to over-estimate the importance of this centralisation of international movements against three of the principal groups of diseases, the inter-relations of which deserve the closest study. The paper by Prof. Forssner on the alleged influence of pregnancy on tuberculosis drew comments, mostly favourable, from many of his audience, and this was the more remarkable as his conclusions would have been generally regarded as hopelessly unorthodox only a few years ago. His thesis that "a pregnancy continuing till term is no more dangerous for first-stage tuberculous women than for healthy women, and by not interrupting this pregnancy we obtain for the race healthy children, just as viable as other children," was supported by much carefully sifted evidence. His material consisted of women treated in the tuberculosis dispensaries of Stockholm and, in a certain proportion of cases, recently confined in maternity hospitals. The Swedish National League against Tuberculosis financed for six years a systematic examination of all the women confined in two maternity hospitals in Stockholm. Of more than 30,000 women thus examined, 1500 were kept under observation on account of the diagnosis or suspicion of tuberculosis, and 341 women who suffered from pulmonary tuberculosis, and who were kept under medical supervision for more than a year after confinement (usually for two years or more), were compared with 396 women whose pulmonary tuberculosis was not complicated by pregnancy. After a two years' observation period, the non-pregnant women in Turban's first stage were compared with the women who had been pregnant and had also been in the first stage of the disease. It was found that the disease was stationary or the patients had improved in 59 per cent. of the first class, and in 60 per cent. of the second class. Only a slight difference in favour of the non-pregnant patients could be found in those whose disease was in the second and third stages. As for the influence of the mother's tuberculosis on the health of her child at birth, it was found that the average weight of the infants of sputum-positive mothers was equal to that of the infants of healthy mothers. There can be little doubt that Prof. Forssner's paper and the confirmation which his views received in Lausanne last month will do much to check the practice, fairly common in some countries, of inducing abortion in the subjects of pulmonary tuberculosis on the assumption that (1) the prospective mother's health will benefit, and (2) the value of her progeny will prove negligible. Prof. Forssner's paper will shortly appear in the *Bulletin* of the International Union.

A NEW X RAY TUBE.



OUR Dutch correspondent sends us an account of an X ray tube recently placed upon the market by the firm of Philips, in Eindhoven, and called by them "Metalix." One of the first trial tubes was recently seen in action by the visiting tuberculosis specialists at Dr. Bronkhorst's sanatorium in Apeldoorn, and the tube was demonstrated at the factory to foreign medical officers of health, who expressed surprise at its appearance. The new tube consists of a cylinder 40 cm. long and 6 cm. in diameter which, through regulation of the current, can be made to give larger or smaller doses of hard or soft rays. These leave the tube in one direction only, through a window in the base. The lining of the tube consists of three layers—chrome iron, lead, and copper—of such thickness that less than one-millionth part of the total energy passes out to be lost or to harm the operator. The space within which the discharge takes place is lined entirely by metal which forms part of the cathode and can be earthed, so that the patient can touch the tube without danger, provided that the transformer is also earthed. The tube can thus be brought without hesitation close up to the object to be X rayed, and as it gives a sharp and fine picture a relatively small current can be used. At present two kinds of tube have been placed on the market: Metalix A, for odontological use, with a maximum voltage of 50,000 and 9 cm. spark-gap, the maximum continuous charge being 5 milliamps, or 15 milliamps for 20 seconds; Metalix B, for radiography and radioscopy, with a maximum voltage of 65,000 and 13 cm. spark-gap, the maximum continuous charge being 8 milliamps or 50 milliamps during a short time. The price of these tubes is stated not to be higher than that of the ordinary Coolidge tube. In the sectional plan the luminous wire (3) is seen stretched between two poles, one of which (2) is in contact with the metallic lining of the tube, and thus can be earthed, the other (5) being insulated. From the luminous wire electrons are sent out into the space bounded by the metallic plates (6) and (7) and by the lining of the tube. Plate (7) contains an opening of such shape and size that the positive field of the anticathode behind it is sufficient to throw electrons from the cathode on the tungsten spiral (4) at a speed determined by the difference of tension existing between the cathode and anticathode. The size of the opening in plate (7) determines at the same time the diameter of the pencil of X rays. These leave in the direction of the axis through the glass window (1) in the base of the tube. An unevenness of the tungsten spiral thus has no unfavourable effect, while the luminous wire is so thin as scarcely to intercept any rays from the anticathode, and no shadow from the wire is cast on the plate. The three insulating layers of the cylinder are shown: chrome iron (9), lead (10), copper (11), while (8) is a glass tube which isolates the anticathode from the cathode. Cooling takes place by filling the space (13) with water. Experiments have been made with tubes of similar type for deep therapy and are likely soon to be placed on the market. It is clear to us that this Dutch tube presents features not possessed by other tubes. It contains its own device for protecting the operator from extraneous rays, the wall of the tube is practically impervious to the rays, and only those which are used pass out. The shape of the tube allows readier approximation to the body, especially in the less accessible regions, while the earthing of the cathode renders it safe for the patient or operator to touch the tube without risk when it is being worked. Radiologists would certainly do well to examine this tube for themselves.

AN EASTERN CLAN.

THE Palaungs are a tribe living in the district of Tawnpeng, which lies in the Shan States about longitude 97° E. and around the twenty-third parallel of N. lat. They are a little-known race and untouched by Western ideas, and as Mrs. Leslie Milne says in the introduction to her book entitled "The Home of an Eastern Clan: A Study of the Palaungs of the Shan States"[1]: "The East is changing so rapidly . . . . that the customs of a people off the beaten track and as yet uninfluenced by contact with the West, are, I think, worth preserving." A vast amount of information about their psychology, religion, and social customs has been collected and arranged by Mrs. Milne. Her first task was naturally to learn the language, and she gives an amusing account of her difficulties. For instance, she had collected the Palaung words for "walk" and "run," "sit" and "stand," but not for "jump." So she jumped over a stick on the floor, and then down off a box. All the Palaungs present shouted "ru," which word she put down in her note-book as meaning "jump." But when she revised her notes with an interpreter she discovered that "ru" really meant "mad." Chapter XII. is devoted to medicine, charms, and omens. The religion of the Palaungs is Buddhist, but tinctured with much survival of spirit worship, and nearly all the ills of life are considered as due to evil spirits. Hence, treatment is mainly a matter of propitiating the evil spirit in question, though, in addition, sundry medicinal plants or animals, and minerals such as lime or wood ashes—i.e., potash—are used. The chapter on spirit worship is particularly interesting, and together with the portion of the book dealing with folk tales is one more proof of how popular beliefs are the same all over the world. On p. 352 is a story of possession by a "pok," which is a spirit living in a graveyard. Can it be that this name is the same as "Puck" or the Welsh name for a fairy—i.e., "pwci"? The story is that of an old woman who died, and after her death her children dressed her body in the habit of a Buddhist nun. Next day, while she lay in her coffin, knockings were heard, and the bystanders on opening the coffin found her apparently alive. She was helped out, set by the fire and given food, which she ate voraciously. She could not speak but only made strange sounds. A year passed and then a monk came to the relatives saying that the revived body was not really their mother, but only the dead body animated by a "pok." He gave them certain directions and on these being carried out the "pok" fled away, leaving only a loathsome corpse apparently dead a year. Let the reader compare this tale with that masterpiece of Stevenson, "Thrawn Janet," and note the curious resemblances. Both bodies after death animated by an evil spirit; both of them unable to speak intelligibly, and both freed from the spirit by the ministrations of a minister of religion. Not anthropologists alone, but all who are interested in the Empire to which they belong ought to be grateful to Mrs. Milne for this book.

BISMUTH IN EXPERIMENTAL SYPHILIS.

Ehrlich's successor, Prof. W. Kolle, has published an account[1] of the prophylactic use of arsenical preparations, mercury and bismuth, in experimental syphilis, and his observations in the case of the last-named drug are instructive. He anticipated that bismuth would not be more effective than mercury in rendering experimental animals resistant to infection, but to his surprise he found that mercury had only a transitory effect in this respect. When, however, he injected insoluble salts of bismuth which were retained in the body as depôts at the site of injection, it proved impossible to inoculate with syphilis successfully. In the case of 26 rabbits given an intramuscular injection of bismuth, followed by intra-testicular inoculations of spirochætes from two to fifteen weeks later, there was not a single instance of a chancre developing. X ray examinations showed that these insoluble salts of bismuth, including the carbonate which is quite insoluble in water, could remain for months embedded in the muscles into which they had been injected. Control tests carried out with 68 animals which had not been given preliminary treatment with bismuth showed that 94 per cent. of them developed a chancre at the site of inoculation. In another series of controls, where the animals had been treated with easily absorbed preparations of bismuth, refractoriness to infection was in most cases short-lived. The upshot of these observations would seem to be that a single bismuth "stopping" left in the body is capable of rendering it refractory to infection with syphilis for as long as four months. Prof. Kolle sounds a warning with regard to drawing hasty conclusions as to the applicability of his observations to man. It must first be shown that the bismuth-treated rabbits did not contract experimental syphilis in some latent guise which dispensed with a chancre at the site of inoculation. For, as in the case of prophylactic treatment with arsenical preparations, it is conceivable that resistance to infection may be acquired only up to a degree which does not exclude the development of an abortive form of syphilis. It is also, as Prof. Kolle points out, desirable that his experiments on rabbits should be repeated on monkeys, and that they should react in the same way before general conclusions are drawn as to the prophylactic value of bismuth. If man reacts like the rabbit in this matter to bismuth, it is obvious that a very important advance has been made toward the prophylaxis of syphilis in man.

WE regret to record the death at Bournemouth, on Sept. 6th, of Sir Frederick Needham, Commissioner of the Board of Control, aged 88 years.

THE death occurred on Sept. 9th of Dr. Robert James Farman, secretary of the Panel and Local Medical Committees of the County of London.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.—The distribution of prizes to the students will take place in the out-patients' hall of the hospital on Oct. 1st, at 3.30 P.M., by Sir Humphry Rolleston. Dr. W. Cecil Bosanquet, senior physician to the hospital, will be in the chair.

DIPLOMA IN PUBLIC HEALTH.—A course of lectures and demonstrations under the Metropolitan Asylums Board, dealing with hospital administration, will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W., by Dr. E. W. Goodall on Mondays and Thursdays at 4.30 P.M. and alternate Saturdays at 10.30 A.M., beginning Thursday, Oct. 2nd, for a period of three months.

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[1] Oxford: At the Clarendon Press. 1924. Pp. 428. 16s.

[1] Deut. med. Woch., August 8th, 1924.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. J. M. Hayes to *Vivid*, for R.N. Barracks, and for specialist duties.

Surg. Lt.-Comdrs.: L. F. Strugnell, R. J. Inman, A. C. Anderson, R. P. Ninnis, J. D. Murphy, H. F. Stephen, G. E. Heath, and E. B. Kelley to *President*, addl., for five months' course of instruction; A. G. McKee to *President*, for course; S. R. Johnston to R.N. Sick Quarters, Dartmouth; and F. L. H. MacDowel to R.N. Hospl., Great Yarmouth.

Surg. Lt.-Comdr. (D.): R. R. Adams to *Pembroke*, temp., for R.N. Barracks.

Surg. Lts. (D.): H. J. Luck to *Victory*, for R.N. Barracks, temp., supy. (on *Warspite*, paying off).

T. J. Prendergast and C. Joiner to be Surg.-Lts., and apptd. to R.N. Hospl., Haslar, for course.

Temp. commission of Surg. Lt. C. Cotter terminated at own request.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. L. Cotterill, on attaining the age for compulsory retirement, is placed on ret. pay.

Maj. R. Storrs to be Lt.-Col., vice Lt.-Col. L. Cotterill, to ret. pay.

Maj. H. G. Monteith is restd. to the estabt.

Capt. J. G. Gill is granted the temp. rank of Maj. whilst empld. as Dep. Asst. Dir. of Hygiene and Pathology, N. Ireland Dist.

Lt. K. Fletcher-Barrett is restd. to the estabt.

MILITIA.

Maj. D. M. Lyon relinquishes his commn. and retains the rank of Maj.

TERRITORIAL ARMY.

Maj. E. H. Marshall resigns his commn. and is granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

Glasgow University Contgt. (Medical Unit), Sen. Div.: Lt. D. M. Harper to be Capt.

ROYAL AIR FORCE.

Flight Lt. W. E. Hodgins (Capt., R.A.M.C.) is granted a permanent commission in the rank stated.

INDIAN MEDICAL SERVICE.

Maj. T. L. Bomford has been appointed Civil Surgeon of Howrah, vice Lt.-Col. D. P. Goil on leave. Lt.-Col. W. T. Furloyson, Inspector-General of Prisons, has been nominated a member of the Bombay Medical Council, vice Lt.-Col. W. Gillity resigned. Maj. C. C. Kelly acts as Civil Surgeon Panch Mahals, on the return from leave of Lt.-Col. E. F. G. Tucker; Lt.-Col. R. M. Carter acts as Presidency Surgeon, Second District, Bombay, with attached duties; and Maj. S. S. Vazifdar continues to act as Second Physician and Registrar, J.J. Hospital, and Professor of Materia Medica and Pharmacy, Grant Medical College, Bombay. Capt. J. M. Shah has been appointed Personal Assistant to the Surgeon-General with the Government of Bombay.

The King has approved the relinquishment of his temporary commission by Lieut. Sengara Pillai Ponniah, on account of ill-health, and is permitted to retain the rank of Lieut.

The King has approved the retirement of the following officers: Senior Assistant Surgeons with rank of Major: W. R. D'Sylva, R. A. Bœrmel, and J. F. Gibson.

DEATHS IN THE SERVICES.

The death is announced on Sept. 2nd at Aberdeen of Surg. Lt.-Col. John Murray, M.B., C.M. Aberd., J.P., Army Medical Staff, retired, in his eighty-second year. He was born on April 6th, 1843; qualifying in 1864 he became assistant surgeon Sept. 30th, 1864; surgeon March 1st, 1873; surgeon-major Sept. 30th, 1876; and retired with hon. rank (Hon. Brig.-Surg.) Dec. 10th, 1884. He resided in London at 12, Ashburn-gardens, S.W. His name was included in the Army List of Non-effective Officers in the war years.

The death occurred on Sept. 4th at Cheltenham, at the age of 91, of Surg.-Gen. Alexander Dudgeon Gulland, who qualified M.D. Edin. 1857, and L.R.C.S. Edin. 1854. He served at the siege of Sebastopol and the expedition to Kertch, in China in 1860, and in the Hazara campaign 1868. He was a friend of General C. G. Gordon ("Chinese Gordon," or "Gordon Pasha" of Khartoum).

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXVII.—TREATMENT OF RHEUMATISM OF CHILDHOOD.

Modes of Onset.

The recognition of rheumatism in childhood at its very earliest stage is of such paramount importance in influencing treatment that a word must be said about the modes of onset of this extremely common and destructive disease. These may conveniently be divided into three groups: (1) Onset with acute symptoms; (2) onset with chorea; (3) insidious onset.

1. *Acute onset* is that familiar to those working in the medical wards of general hospitals. It usually takes the form of an acute febrile polyarthritis, which yields rapidly to treatment, but which is often followed by a varying degree of carditis; in this case the child continues to occupy for some weeks a bed or cot much needed for fresh admissions, but when the cardiac condition seems relatively stabilised, she is necessarily discharged. It is this form of the disease which, under the name of "acute rheumatism," has fostered the erroneous idea of the arthritis being a disease in itself, whereas, indeed, it is only, like acute pleurisy in tuberculosis, an acute symptom of a grave underlying constitutional infection.

2. *Onset with chorea* is also common. These cases commonly develop endocarditis at an early stage. At any time during the course of the chorea a heart lesion may (but does not always) develop, so that a long period of uncertainty as to the future is inevitable even in the most favourable cases.

3. *Insidious onset* is too often recognised only in the past tense. The symptoms are, indeed, numerous enough—"growing pains," sore-throat, headache (too often attributed to eye-strain), pallor, wasting, and languor—but none of these may make a sufficient appeal to the hard-worked mother of a large family, and often the child is only taken to hospital for shortness of breath due to advanced cardiac disease. Into this third group of cases there is a steady drift of children from the first and second groups, who, as a result of recrudescences of infection, become the subjects of a chronic rheumatic carditis, which at the worst destroys life in a few months or weeks and at the best is likely to lead to chronic cardiac insufficiency in later life. Occupying positions intermediate between these two extremes are thousands of cases, presenting all kinds of combined symptoms and signs of cardiac infection and insufficiency, the prognostic significance of which is the only key to proper treatment.

Treatment may conveniently be considered under the same three headings as have been used above—viz., treatment directed against (*a*) acute symptoms, (*b*) chorea, (*c*) chronic carditis, it being understood, however, that the third class of treatment applies to every case of rheumatism occurring in children.

Treatment of Acute Symptoms.

The arthritis and pyrexia in an acute case rapidly yield in young subjects to treatment by salicylates. Rheumatism is rare below the age of 6 years. To a child of 8 or 10 years, 15 gr. of sod. sal. may be given with 30 gr. of sod. bicarb. every other hour for eight hours, and thereafter four-hourly until the temperature becomes normal. After this the medicine must be continued thrice daily for at least a fortnight. In the meantime the child is kept in bed between blankets, and any affected joint is supported by cotton-wool and a small many-tailed bandage. In the case of a persistently painful joint, linseed poultices applied over a single painting with tincture of iodine are useful. While any acute symptoms remain the diet should be strictly limited to milk and clear fluids, a milk diet being of great importance in the reduction and prevention of fever; meat extracts are not allowed. If tonsillitis is present the openings of the tonsillitic crypts must be repeatedly cleared by sponging with cotton-wool swabs; the mouth must be kept clean and the bowels opened daily. In the absence of all complications, rest in bed should be, if possible, continued for six weeks in all.

Chorea.—The treatment of chorea involves rest in bed and emotional restraint in all but a very few cases in which the neurotic element is so marked as to make early re-education of the first importance. The children should be encouraged to occupy themselves with sewing, knitting, or jig-saw puzzles for an hour or two every day, and a careful and discriminating nurse will know how to steer them between the varying emotions, dependent upon fatigue on the one hand and boredom on the other. Arsenic is of much use, given as Fowler's solution raised by ♏i. or ♏ii. week by week from an initial dose of ♏iv. t.d.s., until the choreic movements are in abeyance. The dose may then be continued unchanged for three weeks and then gradually lowered week by week until it is omitted altogether. Thereafter the child may start getting up, an added quarter of an hour every day being quite sufficient. During this stage, also, breathing exercises are most useful for the dissociated respiratory movements.

Prevention and Treatment of Rheumatic Carditis.

In the prophylaxis and treatment of rheumatic carditis is involved one of the chief outstanding problems of public health. Rheumatic disease stands in relation to tuberculosis of childhood, as regards frequency in about the relation of 2 to 3, but, in great contrast to tuberculosis, as yet no serious effort has been made to cope with what Dr. F. J. Poynton has rightly called a preventable disease, great destroyer of life though it is. Questions of importance in the general prevention of the disease include the improvement of housing conditions, the education of school authorities to recognise early symptoms, and the desirability of notification to enable cases to be followed up.

Management of the Individual Case.

1. *Tonsillectomy.*—Whenever it can reasonably be assumed that the tonsils may be a seat of rheumatic infection, tonsillectomy should be carried out. A fortnight's administration of salicylate of sodium thrice daily while the temperature is normal should precede operation. The evidence in favour of tonsillectomy is not yet conclusive, especially when chorea has been present, but on the whole it appears useful, especially if carried out after the first attack and before the heart is involved.

2. *Fresh Air.*—After tonsillectomy (and, in acute cases, after the completion of the treatment already described for these) a child who has had any form of rheumatic disease should be sent away from the environment in which it was contracted for from six to eight months, especially when the home is in a large town or a damp climate. This long convalescence should be insisted on whether complications in the shape of heart disease and chorea are present or not. Such a procedure often appears unreasonable to the parents, since the child seems to them and professes personally to be absolutely well. Nevertheless, it appears likely that when the allotted term of fresh air treatment is lowered beneath six to eight months, recrudescence is more than likely to occur, after the return home, in the rheumatic, just as in the tuberculous child.

3. *Rest.*—The ordinary convalescent homes, it is generally agreed, are not suited to deal with rheumatic cases. The life there is too active; rheumatic children should not be allowed to run about with those convalescent from such self-limiting diseases as pneumonia and whooping-cough. This means that accommodation should be found for them in some country home or ward where there is suitable nursing supervision. The number of available beds in this country is entirely inadequate for the thousands of children requiring them. Nevertheless, a few such places exist, of which the new heart home at Hartfield is the most recent.

As to the question of rest in bed, opinion is apparently still divided, though such authorities as Sir James Mackenzie and Dr. R. Hutchison recommend as much as six months' rest in bed while there is still evidence of infection in the heart. After observation of a number of cases during some length of time, I have come to the conclusion that the choice between rest in bed and progressive infection of the heart is in many cases unavoidable, and I have certainly never seen a child the worse for a long period of rest in bed. The children must be kept warm and should be out in the fresh air as much as possible; they should sit up in bed, since in that position the respiratory muscles act at greater advantage. Under such conditions the patients remain very contented and happy, provided that disappointment is not caused by foolish suggestions that "perhaps the doctor will let you get up this week," &c. Such suggestions, and the type of visitor who makes them, should be rigorously discouraged, since any emotional upset is very bad for rheumatic children. Treatment by rest in bed should be continued until three conditions are fulfilled: (1) The disappearance of anæmia. (2) The return of the pulse to normal, and the disappearance of the excitability characteristic of the rheumatic heart. In this connexion the return of the normal respiratory variations of the pulse is a sign of great assistance. (3) Stabilisation of the physical signs given by the heart. At this stage the borders of the heart assume fixed positions and, a sign of the greatest importance in mitral disease, the apical diastolic bruit, caused by obstruction to the smooth flow of blood over the mitral valve, ceases to vary its position in the cardiac cycle. These conditions fulfilled, the patient may be allowed gradually to get up, an added quarter of an hour being allowed daily so long as the physical signs remain constant. At the end of a month the patient will then be having an eight-hour day out of bed; but a long rest is always to be given in the middle of the day. At this stage respiratory and other physical exercises, suitably graduated, are of importance. During all this time the heart and pulse must be watched carefully. I have never seen the heart-rate do anything but rise at the commencement of getting up, though the contrary has been reported.

4. *Drugs.*—Salicylates should be given a good trial in every case where there is a recrudescence of pain or pyrexia, and will be successful in reducing these symptoms in all cases except those of advanced infective carditis. Should they fail, arsenic should be tried. The action of digitalis is uncertain, but a certain number of cases of persistent tachycardia undoubtedly respond to full doses of the tincture. In others there is no effect. Possibly the electrocardiograph may in the future differentiate more exactly the group of those cases among children who respond to digitalis from those who do not. Iron and hæmoglobin should be used during the long convalescent stage.

5. *After-care.*—The child having returned home at the end of six or eight months, regular and prolonged after-care is still necessary. When the heart has been damaged a place should be secured for the child at a school of the type that is provided by the London County Council for physically debilitated children. As a result of a long series of investigations, Dr. W. St. Lawrence, of New York, has come to the arresting conclusion that not until a given case has remained free from recrudescences for three years can its recovery be regarded as fairly safe.

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Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

The following table gives some of the principal statistics for 1923 of eight urban districts :—

Name of urban district.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Willesden	169,831	18·8	9·5	0·8	1·2	1·6	20	53	3·4
Tottenham	154,300	20·0	9·1	0·9	1·1	1·8	29	58	2·3
Ilford	89,020	18·8	9·5	0·7	1·3	1·2	21	41	2·5
Edmonton ..	69,590	22·2	9·5	1·3	1·1	1·3	28	55	1·3
Heston and Isleworth .	46,505	17·4	9·8	0·9	1·0	1·6	26	55	8·3
Barry	39,710	22·9	10·7	1·1	1·1	2·0	46	78	4·6
Spenborough .	31,520	15·9	13·4	1·0	1·4	3·0	40	96	10·0
Weston-super-Mare	25,320	12·8	12·4	0·9	1·4	1·5	9	46	6·2

Willesden.

Dr. George F. Buchan gives particulars as to the effect on the attendances at the maternity and child welfare and school clinics of the system of charges imposed by the Willesden Council. At the clinics for mothers and children under 5 years the total attendances for 1923 were 23,271, showing a fall of 4234 when compared with 1922. The table given shows a sudden drop in the attendances after the imposition of a registration fee for the clinics on Oct. 1st, 1921. The withdrawal of the registration fee for the school clinic on July 10th, 1922, is followed by a gradual recovery in the attendances. The registration fee for the maternity and child welfare clinic was withdrawn on Feb. 28th, 1923. A new scheme was put into force on April 1st, 1923, with the result that the attendances at the maternity and child welfare clinic are about half, and those at the school clinic about two-thirds of the attendances recorded in 1921. The report of the school dentist shows that only 21 per cent. of the dental defects followed up were treated, and the records indicate that a very small percentage of children receive treatment through hospitals and private dental practitioners. Dr. Buchan discusses the work of the special schools at some length. One of the needs is a better ambulance service for conveying the children to these special schools. At the Leinster-road school for mentally defective children training in some simple occupation requiring manual dexterity only during the last years of school life from 14 to 16 is needed. Cobbling, chair-caning, basket-weaving, and the mechanical part of simple tailoring are given as examples. The accommodation at the Furness-road school for physically defective children is unsatisfactory and would not be considered good for normal children. To some extent this unsatisfactory accommodation is balanced by the efforts of the Invalid Children's Aid Association in sending the children to convalescent homes at the seaside and in the country. The work of the Leopold-road school for physically defective children is interfered with by the lack of ambulance accommodation. Dr. Buchan also refers to the need for a local orthopædic clinic, and his remarks are endorsed by Dr. W. J. J. Stewart, the medical superintendent of the municipal hospital, who states that since the orthopædic work at the surgical out-patient clinic was discontinued there is no place near at hand where this treatment can be carried on. When the out-patient department was closed the number of children requiring orthopædic treatment was at its highest, and the expense of transporting these crippled children to the larger London hospital clinics is quite out of the question. Dr. Buchan points out that, in addition to the physically defective children who attend the two-day special schools, there are a further two hundred or so who should be provided for in an open-air day school. It is pointed out that the present staff of sanitary inspectors is insufficient to deal with housing repairs. The Council has endeavoured to find a simple method of enforcing the adequate maintenance of property without recourse to complicated legal procedure and have interviewed the Ministry of Health on the matter.

Tottenham.

Dr. David C. Kirkhope says that the housing difficulty remains a formidable proposition. As long as there is no surplus of houses, occupied houses cannot be brought up to a satisfactory standard of repair. Dr. Kirkhope expresses his astonishment that vital statistics continue so favourable under existing housing conditions, and thinks it not surprising that there is some scepticism in the minds of those who used to regard a satisfactory environment as the essential factor in the production of low death- and sickness-rates. An exhaustive report has been made on the pollution of the river Lee with a view to getting the County Council to deal with the matter. Two main sources of pollution have been discovered. The Milk and Dairies Amendment Act, 1922, which enables the Council to refuse to register purveyors of milk unless the premises are satisfactory, has been used with advantage. In several cases registration was withheld until requirements had been complied with, and in one instance a purveyor was struck off the register. Dr. Kirkhope points out that the antenatal clinic and district maternity home are not used as much as they might be, and expresses his opinion that every primiparous woman ought to seek the advantages that a maternity hospital offers. In his school report Dr. Kirkhope refers to the considerable number of small private schools in the district. These are mostly for young children and are generally conducted in the living rooms of private dwellings. In view of overcrowding, insufficient lavatory and w.c. accommodation, he thinks all these schools should be brought under the supervision of the local education authority. Arrangements have been made for the treatment of discharging ears by ionisation, and Dr. Kirkhope is in the happy position of being able to report that the clinics provided by the committee and the arrangements made with other authorities appear practically to cover every phase of medicine and surgery such as is necessary for the treatment of diseases of childhood.

Ilford.

Dr. A. H. G. Burton says the maternity home has proved its usefulness in spite of its not being entirely suitable for the purpose. He is, therefore, glad to report that the provision of a modern maternity home will be accomplished in the course of a few months. Dr. Burton states that an investigation into the "Milne" treatment of scarlet fever has shown that the method is an unsound one, and that the treatment (*a*) does not prevent "return" cases, (*b*) does not prevent the spread of infection to susceptible persons, and (*c*) does not prevent secondary complications. Dr. Burton states that the new milk orders have not met with any marked success, and thinks there will not be much improvement in the bacterial cleanliness of milk until a standard is fixed below which no milk must be retailed at all. As the result of a newspaper scare with regard to the retailing of tinned meats from army dumps, an inspection was made of grocers' stocks, but no justification was found for the scare in Ilford. Dr. Burton refers with satisfaction to the fact that 93 per cent. of the defects of vision detected among the school-children were remedied by the work of the ophthalmic surgeon, Mr. R. S. Charsley. The provision of an open-air school for Ilford is now under the consideration of the education committee. There is still no adequate provision for mentally defective children.

Edmonton.

Dr. H. W. Harding gives as the outstanding needs of his district: (1) more housing accommodation; (2) more travelling facilities; (3) a more hygienic method of disposing of house refuse than the present one of dumping; (4) a satisfactory method of treating the sewage. Dr. Harding states that there has been a set back in cleanliness in the schools, and associates this with the housing conditions. It is hoped to deal with the sewage problem during the present year. The recent circular from the Ministry with regard to cancer was discussed by the Edmonton Medical Society, which came to the conclusion that the local facilities for consultations, pathological examinations, treatment, and the transport of patients were satisfactory, that the public were being sufficiently educated in the matter by the press, &c., and that there was a feeling of nervous apprehension among the population that rendered special propaganda work undesirable. A mothercraft class has been started at the day nursery. Senior girls in groups of six attend one day per week for instruction from 9 to 10.45 A.M. for a period of six weeks. Sixty girls will pass through the class every term. The experiment has been a success and the girls are keenly interested in the work.

Heston and Isleworth.

Dr. Elwin H. T. Nash mentions an unusual incident in connexion with a well used by a dairyman for cooling purposes. The drawpipe of the well was eaten away and the water was acid. The cause of the trouble was found to be the effluent from some neighbouring works, which could not be discharged into the sewers on account of its acidity and colour, and was in consequence discharged into a deep soak-away in the gravel. The proprietors of the works provided the dairyman with a refrigerating plant and ultimately found a method for removing the colour and neutralising the acidity of their effluent. Under the heading of water-supply the health department have done useful work by securing the substitution of 108 taps direct from the main in lieu of water-supplies drawn from inaccessible and uncovered cisterns. Dr. Nash, in common with other medical officers of health of large urban districts, thinks the control of the midwives should be in the hands of the district council. Antenatal work has been hitherto negligible in amount owing to the lack of suitable premises. Negotiations for the latter are in progress. In the school report Dr. Nash gives some examples of satisfactory results obtained by persistent and persevering following-up. He refers to the unsatisfactory treatment of discharging ears and would like to see ionisation established. Dr. Nash points out that a large proportion of enlarged tonsils disappear after a septic mouth has been cleaned up, but, if operation is necessary, he is entirely opposed to slicing and favours complete enucleation. Only a small proportion of the children requiring dental treatment receive it. Dr. Nash would like to see orthodontic work established in the schools by coöperation between the school dentists and the consulting orthodontist at the hospital.

Barry.

Dr. Percy W. Kent says the present distressing housing conditions will exist until private enterprise is again available, although the council are doing their best to meet the demand for houses. Dr. Kent regards the maternity and child welfare work as the most important branch of the council's public health activities—even more important than remedying defects in school life. Dr. G. H. Winch, medical officer of the Glamorgan County V.D. Clinic at Barry, draws special attention to the regular attendance of patients, both male and female, in their evident keenness to be thoroughly treated and cured. Old-standing cases of syphilis and gonorrhœa still drop in for treatment and state that they have only just heard of the clinics. Dr. Winch concludes that there is even yet insufficient propaganda work. He further mentions the inadequate provision made for the treatment of seamen, especially in foreign ports. In the school report Dr. Kent mentions a new departure—namely, an Education Week, held in June. The programme included special excursions. The schools and school clinics were open for parents to see the work in progress. An illustrated guide was issued which included a brief history of the school service of Barry. The "week" proved a great success. Large numbers of persons attended and displayed a keen interest in the work of schools and clinics.

Spenborough.

Dr. Lawrence Pick shows that Spenborough, Halifax, and Keighley are the only districts in the West Riding where there are more males engaged in metal than in textile work. The census showed there were 2994 female and 1855 male textile workers, whilst there were 3145 male metal workers. In dealing with the work of the child welfare centres, Dr. Pick says there is a tendency for parents to regard them as hospital out-patient departments. Rather more dried milk was sold than in the previous year, but over 500 lb. less was supplied free. The council are negotiating for a site for a public abattoir. An inspection of the cowsheds shows that a considerable number have an air space of under 400 cubic feet per cow. Some of them are said to be in total darkness when the door is shut. During the year the Education Committee made satisfactory arrangements with neighbouring authorities for a dental service for the school-children and for the X ray treatment of ringworm. Cleanliness inspection among the school-children shows that about 4 per cent. of the parents are quite indifferent to verminous conditions in their children. The time is come, says Dr. Pick, when more vigorous action will have to be taken.

Weston-super-Mare.

Dr. John Wallace reports the satisfactory completion of the Banwell water scheme since the close of the year. The old water-supply was becoming increasingly hard and brackish. The provision of a pulverising plant has, it is hoped, satisfactorily provided for the disposal of refuse and done away with the need for tips. Suitable accommodation for the health department and a new infectious diseases hospital are among the outstanding needs. All the slaughtering is done at the public abattoir, and humane killers are used for cattle and pigs. The sanitary inspector points out, however, that a considerable amount of meat killed outside the town is brought into it.

SCHOOL MEDICAL WORK IN LONDON.

Sir William Hamer's report on school medical [illegible] in London during 1923 is good reading. Two hu[illegible] and eighteen thousand children obtained treat[illegible] This figure has kept on growing in response to [illegible] demand, and will probably continue to grow [illegible] high-water mark is reached, when preventive [illegible] ought to make themselves felt and the [illegible] will subside. Dr. C. J. Thomas, who is resp[illegible] this department, has good c[illegible] to [illegible] himself on the efficiency of an [illegible] with the medical inspection o[illegible] over [illegible] children, and the medical t[illegible]ent [illegible] of those requiring it. E[illegible] children in need of spectac[illegible] [illegible] figure has never been to[illegible] and surely indicates a high [illegible] of [illegible]

The work in London [illegible] The greatest improvement [illegible] direction of personal cleanli[illegible] The percentage of elder [illegible] heads now stands at over [illegible] of the school nurses is ed[illegible] steady improvement which [illegible] in character is to be pr[illegible] improvement due to comp[illegible] evanescent when the comp[illegible] The good work of the Council's [illegible]

in the progressive improvement in the dental condition of the 12-year old group. The number of children with four or more decayed teeth in this group has dwindled from 10 to less than 3 per cent., while of the junior scholarship candidates the number requiring dental treatment has fallen from 39 per cent. in 1913 to 7 per cent. to-day. Dr. E. O. Lewis's important investigation into the question of whether enlarged tonsils in children increase susceptibility to infectious disease, and whether susceptibility is decreased by removal of enlarged tonsils, showed the incidence of infectious disease amongst the school population generally to be 28 per cent., while upon those who had had enlarged tonsils removed it was only 4·8 per cent. On the other hand, Kaiser's[1] investigation into the effect of tonsillectomy on the general health of 1200 children in New York, as compared with an equal number of controls during the same period who were not operated on but in whom the indications for operation were the same, showed that the incidence of scarlet fever was not affected, though the severity of the attack may have been reduced.

The charts published appear to dispose effectively of a most interesting hypothetical connexion between the flea and scarlet fever; indeed, on the chart scarlet fever appears to increase as the activity of the Council's cleansing scheme disperses the flea.

That scarlet fever is a throat infection appears to be probable from the results of the Dick experiments and investigations in America, which are disclosing the possibility that an active immunisation of some sort will shortly be available. In this connexion it is interesting to note that not in one of the 230 cases in London certified as suffering from chorea was the disease a sequel of scarlet fever; indeed, Sir William Hamer considers that the relationship between chorea and rheumatism has been somewhat exaggerated in the past judging by the age distribution and the low incidence of cardiac disease among the so-called choreic cases. "The general features of the statistics support the conclusion suggested by the clinical examination of several cases, that there is an increasing tendency to certify as chorea conditions of purely neurogenic character. The substantial increase in the number of girls suffering from chorea is another proof that what hitherto was regarded as simply adolescent instability is now called chorea . . . that there is of late an increase of nervous trouble among children is shown by further analysis of the figures." From 1920 to 1923, 8·21, 7·8, 8·44, and 10·05 per cent. respectively of the out-of-school cases were absent owing to nervous trouble. In 1920 the proportion of out-of-school cases suffering from chorea was only 7·4 per cent., in 1921 it was 8·19 per cent., 9·2 per cent. in 1922, and in 1923 it was 9 per cent. Sir William Hamer considers that many of the cases of chorea would be more appropriately classified under nervous disorders, and puts forward a suggestion that the effect of air-raids on a child of 8 or younger might be the cause of the increase of nervous instability among the adolescent; it is quite possible that the nervous apprehension obtaining in most homes during the war is responsible for such a marked increase in those two sets of figures.

While the number of children from 3 to 5 years of age in the infants' departments of the elementary schools has increased to over 50,000, it is unfortunate that the number of nursery schools in London has remained the same. The Geddes report showed how inadequate was the provision for these children in the elementary schools. Dr. Margaret Hogarth, outlining the differences between the provision made for this group in the two types of school, sums up the fundamental difference in the fact that the amenities of the nursery school approach more nearly that of a middle-class home, but as far as main buildings are concerned, for summer and winter use, "few can be compared with the newer type of elementary school with French windows opening into a sunny playground, a large airy hall, and well warmed cloakroom where wet clothes and boots can be dried. . . The nursery school recognises that personal attention to the requirements of the child is just as important as attention to his mental requirements." There is no doubt that the inadequate provision for the physical and mental requirements of this age group is due to the fact that the teachers employed have had no special training to meet the case. The requirements of children from 2 to 5 years of age differ materially from those of older children, and the question of a proper training for their supervision is equally one for medical and educational consideration. A scheme for the special training of London County Council teachers in this work is needed and would not be difficult to formulate. It is to be hoped that London will see its way to tackle this really urgent question and to remove the unsightly gap which the absence of suitable medical and educational provision for children of 2 to 5 years of age undoubtedly leaves in the County Council's excellent scheme for child welfare and social progress.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 30TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 51: scarlet fever, 1384; diphtheria, 595; enteric fever, 96; pneumonia, 383; puerperal fever, 37, cerebro-spinal fever, 10; acute poliomyelitis, 37: acute polio-encephalitis, 5: encephalitis lethargica, 55; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 107. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 6 deaths from enteric fever, none from small-pox, 9 from scarlet fever, 22 from diphtheria, 12 from measles, 20 from influenza. In London itself the diphtheria deaths numbered 8.

Special Articles.

NOTE ON THE DESTRUCTION OF RATS BY EXHAUST GAS.

By D. B. Blacklock, M.D. Edin.,
DIRECTOR, SIR ALFRED LEWIS JONES RESEARCH LABORATORY, FREETOWN;
AND
W. H. Peacock, M.B., B.S. Durh., D.P.H.,
SENIOR SANITARY OFFICER, SIERRA LEONE.

The essentials of a satisfactory agent for the destruction of wild rats are that it should be highly lethal to rats, relatively innocuous to man, devoid of deleterious effects on cargo, furnishings, and fittings, and that it should be cheap and simple in application. The agents at present in use for this purpose—namely, sulphur dioxide, hydrogen cyanide[1] and carbon monoxide as generated by the Giemsa-Nocht apparatus—all fail in one or other of these essentials. We believe that the following experiments demonstrate that in the exhaust gases of the petrol engine we possess ready to our hand an agent which for the destruction of the wild rats comes nearer to the fulfilment of these requirements than any hitherto employed. The petrol used by us was either "Sphinx" or "Tydol," but other brands may doubtless give similar results.

Experiments with Motor-car Exhaust on Rats.

In a Box.—The gas was led from the exhaust pipe of an Overland car of 16–18 h.p., by a length of rubber tubing, through the lid of a box which measured 18 × 12 × 12 inches. Each rat used for experiment was introduced in a small cage into the end of the box remote from the inlet tube. The results are shown in Table I.

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TABLE I.—*Showing the Effects on Wild Rats of the Exhaust Gas in Box Experiments.*

Time.	*Mus rattus.*		*Mus norvegicus.*	
	Number used.	Result.	Number used.	Result.
5 minutes	1	Dead.	—	—
3 ,, ...	1	,,	—	—
2 ,, ...	—	—	4	Dead.
1 ,, ...	1	Dead.	1	,,
1 ,, ...	3	,,	2	,,
45 seconds	—	—	1	Collapsed.
30 ,, ...	2	1 dead 1 collapsed	—	—

In these experiments all rats, brown or black, were killed by one minute's exposure to the gas.

For comparison the effects of sulphur dioxide from a hand-driven Clayton apparatus were tested. The optimum number of revolutions of the fan for this machine was ascertained to be about 50 per minute. Below and above this rate the lethal effect on wild rats fell away. In Table II. are given the results of using sulphur dioxide from the machine.

TABLE II.—*Showing the Effects of Sulphur Dioxide on Wild Rats in Box Experiments.*

Time.	*Mus rattus.*		*Mus norvegicus*	
	Number used.	Result.	Number used.	Result.
5 minutes	1	Dead.	—	—
3 ,, ...	1	,,	—	—
2 ,, ...	1	Alive.	2	Alive.
1 ,, ...	2	,,	3	,,

In these experiments no rat, brown or black, was killed by one minute's exposure to the sulphur dioxide gas.

In Drains.—A concrete drain was roofed in with planks and covered with earth. It was tested in lengths varying from 4 ft. to 81 ft. Rats were liberated into the drain at various points and the gas turned on; or, again, they were confined at each end of the drain or at chosen distance from the inlet end. The gases were tested both up hill and down hill. Contrary to expectation, the exhaust gas proved superior to Clayton gas even down hill in a steep drain 81 ft. long. Two black rats at the lower end of the drain were quite unaffected by 30 minutes' application of the Clayton machine to the upper end of the drain, whereas this exposure to exhaust gas killed such rats outright, and even 18 minutes' exposure caused collapse. *Mus norvegicus* was unaffected by 30 minutes' exposure to the Clayton, while the same period of the exhaust either killed or caused collapse. The introduction of exhaust gas into a drain did not drive the rats out, whereas the Clayton gas did so. Again, rats showed no reluctance to enter the drain when full of exhaust gas; they declined to enter when it was full of sulphur dioxide.

The fact that rats tend to try to escape from the sulphur dioxide fumes indicates that in warehouses and ships undergoing fumigation they would make for a more respirable atmosphere. As sulphur dioxide is very slow in its effects they have ample time to seek out the least poisonous areas. This, taken in conjunction with the difficulty of applying sulphur dioxide equally to all parts of a ship, helps to explain the frequency with which wild rats survive such fumigation.

In a Sealed Chamber.—A room constructed of concrete was used, the windows being sealed with brown paper having inspection windows inset. The rats were distributed in cages on the floor, near the ceiling, and at the inspection windows. The door was sealed and the gas introduced through a circular aperture cut to fit the delivery tube. The capacity of the chamber was 2160 cubic feet. Several experiments were carried out with each gas.

Exhaust gas was applied to the chamber for half an hour: at the end of that time, on opening up, of eight rats used five were dead and three collapsed. The gas was next applied for one hour; at the end of this experiment all the rats used, five in number, were dead.

Sulphur dioxide was applied to the chamber for half an hour with the fan rotating at 50 revs. p.m.; at the end of that time, on opening up, of eight rats used, four black and four brown, none were dead. Applied for half an hour at 50 revs. p.m., followed by six hours under seal, the gas killed only two out of eight rats. Applied for half an hour at 100 revs. p.m., followed by six hours under seal, the gas killed none of eight rats exposed, four black and four brown. The unsatisfactory results obtained from the Clayton apparatus led us to discard it and use sulphur candles for future comparisons.

By making use of the inspection windows the different effects of the two gases on the rats could be studied and timed. It was seen that rats exposed to the exhaust gas showed no sign of any disturbance up to a period of 15 minutes: this was the earliest time at which the effects began, the latest being 25 minutes. The first effect noted was restlessness; the rat suddenly began to run about anxiously; in a minute or so it collapsed, took a few deep gasps, and died. Rats removed from the gas atmosphere immediately after collapsing on the bottom of the cage recovered with great regularity, but if not immediately removed they invariably died without further struggle. With sulphur dioxide as administered by the Clayton hand machine the rats showed slight lacrymation and respiratory effects; with the candles burning they began after half an hour to lacrymate and cough. They moved about anxiously, then huddled themselves up in a corner; soon they moved about again, becoming more and more disturbed in their respiration. The action of the gas was productive of great distress, and yet was very slow in its ultimate effect. Even with six candles burning, which is much in excess of the number stated to be requisite, it required three hours to produce the death of wild rats. The animals' eyes were then covered by an opaque film, and the animals were much contorted. All the evidence from these experiments shows that in exhaust gas from a petrol engine we have an agent which is extremely lethal to rats, which is rapid in its action, and which kills with the minimum of suffering.

Experiments with Motor Launch Exhaust on Rats.

In Box.—The exhaust here was only obtainable mixed with the cooling water of a 10 h.p. engine; the gas and water were discharged through the same pipe. Preliminary experiments proved that with the water turned off the exhaust gas was fatal in one minute. There was some blackening from the carbon when so used. It was found that by allowing the water to issue with the exhaust gas the lethal effect of the gas was not impaired, and the gas was clean and produced no blackening effect.

In Ship's Lighters.—An empty lighter was used for the next experiment. This had a watertight hold of 2304 cubic feet capacity. It was the usual type of lighter used for loading at Freetown, with tightly fitting hatches and tarpaulins battened down. The experimental cages were distributed high and low in it, and the exhaust gas with water passed in a tube under one of the hatches supported on a wedge, the tarpaulin being drawn tightly round it; the gas entered the hold at three-quarters of its depth. Six rats, three black and three brown, each in a separate cage were used. The engine of the launch was run for an hour and the hatches opened. The gas rapidly escaped in an easily visible cloud, and all the rats were found to be dead. After the experiment had been going on for 35 minutes a rat was lowered into the hold for five minutes; when removed it was collapsed on the bottom of the cage but still breathing slowly, and it recovered. It is clear that even so early as this the concentration of the gas in the empty lighter was almost sufficiently high to have a lethal effect.

The lighter was then loaded up with palm kernels in hessian bags and the hatches put in position; one hatch at each end was then lifted and 12 rats were admitted free to the hold, eight in the far end and four in the near end. The hatches were replaced, covered with the tarpaulins, and battened down. Exhaust gas was run in under one hatch for an hour. The hatches were raised, and after the lapse of less than ten minutes the cargo was removed. Of the 12 rats liberated all were found: ten were dead and two collapsed; these recovered later.

These experiments show that rats free even in a loaded lighter are rarely capable of escaping from the lethal action of the gas by sheltering in crevices between the cargo. It appears probable that a slightly longer exposure would have killed 100 per cent. of the rats. Considering that the whole operation in this experiment from the time of commencing fumigation to the time when the labourers started

in the progressive improvement in the dental condition of the 12-year old group. The number of children with four or more decayed teeth in this group has dwindled from 10 to less than 3 per cent., while of the junior scholarship candidates the number requiring dental treatment has fallen from 39 per cent. in 1913 to 7 per cent. to-day. Dr. E. O. Lewis's important investigation into the question of whether enlarged tonsils in children increase susceptibility to infectious disease, and whether susceptibility is decreased by removal of enlarged tonsils, showed the incidence of infectious disease amongst the school population generally to be 28 per cent., while upon those who had had enlarged tonsils removed it was only 4·8 per cent. On the other hand, Kaiser's[1] investigation into the effect of tonsillectomy on the general health of 1200 children in New York, as compared with an equal number of controls during the same period who were not operated on but in whom the indications for operation were the same, showed that the incidence of scarlet fever was not affected, though the severity of the attack may have been reduced.

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The fact that rats tend to try to escape from the sulphur dioxide fumes indicates that in warehouses and ships undergoing fumigation they would make for a more respirable atmosphere. As sulphur dioxide is very slow in its effects they have ample time to seek out the least poisonous areas. This, taken in conjunction with the difficulty of applying sulphur dioxide equally to all parts of a ship, helps to explain the frequency with which wild rats survive such fumigation.

In a Sealed Chamber.—A room constructed of concrete was used, the windows being sealed with brown paper having inspection windows inset. The rats were distributed in cages on the floor, near the ceiling, and at the inspection windows. The door was sealed and the gas introduced through a circular aperture cut to fit the delivery tube. The capacity of the chamber was 2160 cubic feet. Several experiments were carried out with each gas.

Exhaust gas was applied to the chamber for half an hour; at the end of that time, on opening up, of eight rats used five were dead and three collapsed. The gas was next applied for one hour; at the end of this experiment all the rats used, five in number, were dead.

Sulphur dioxide was applied to the chamber for half an hour with the fan rotating at 50 revs. p.m.; at the end of that time, on opening up, of eight rats used, four black and four brown, none were dead. Applied for half an hour at 50 revs. p.m., followed by six hours under seal, the gas killed only two out of eight rats. Applied for half an hour at 100 revs. p.m., followed by six hours under seal, the gas killed none of eight rats exposed, four black and four brown. The unsatisfactory results obtained from the Clayton apparatus led us to discard it and use sulphur candles for future comparisons.

By making use of the inspection windows the different effects of the two gases on the rats could be studied and timed. It was seen that rats exposed to the exhaust gas showed no sign of any disturbance up to a period of 15 minutes; this was the earliest time at which the effects began, the latest being 25 minutes. The first effect noted was restlessness; the rat suddenly began to run about anxiously; in a minute or so it collapsed, took a few deep gasps, and died. Rats removed from the gas atmosphere immediately after collapsing on the bottom of the cage recovered with great regularity, but if not immediately removed they invariably died without further struggle. With sulphur dioxide as administered by the Clayton hand machine the rats showed slight lacrymation and respiratory effects; with the candles burning they began after half an hour to lacrymate and cough. They moved about anxiously, then huddled themselves up in a corner; soon they moved about again, becoming more and more disturbed in their respiration. The action of the gas was productive of great distress, and yet was very slow in its ultimate effect. Even with six candles burning, which is much in excess of the number stated to be requisite, it required three hours to produce the death of wild rats. The animals' eyes were then covered by an opaque film, and the animals were much contorted. All the evidence from these experiments shows that in exhaust gas from a petrol engine we have an agent which is extremely lethal to rats, which is rapid in its action, and which kills with the minimum of suffering.

Experiments with Motor Launch Exhaust on Rats.

In Box.—The exhaust here was only obtainable mixed with the cooling water of a 10 h.p. engine; the gas and water were discharged through the same pipe. Preliminary experiments proved that with the water turned off the exhaust gas was fatal in one minute. There was some blackening from the carbon when so used. It was found that by allowing the water to issue with the exhaust gas the lethal effect of the gas was not impaired, and the gas was clean and produced no blackening effect.

In Ship's Lighters.—An empty lighter was used for the next experiment. This had a watertight hold of 2304 cubic feet capacity. It was the usual type of lighter used for loading at Freetown, with tightly fitting hatches and tarpaulins battened down. The experimental cages were distributed high and low in it, and the exhaust gas with water passed in a tube under one of the hatches supported on a wedge, the tarpaulin being drawn tightly round it; the gas entered the hold at three-quarters of its depth. Six rats, three black and three brown, each in a separate cage were used. The engine of the launch was run for an hour and the hatches opened. The gas rapidly escaped in an easily visible cloud, and all the rats were found to be dead. After the experiment had been going on for 35 minutes a rat was lowered into the hold for five minutes; when removed it was collapsed on the bottom of the cage but still breathing slowly, and it recovered. It is clear that even so early as this the concentration of the gas in the empty lighter was almost sufficiently high to have a lethal effect.

The lighter was then loaded up with palm kernels in hessian bags and the hatches put in position; one hatch at each end was then lifted and 12 rats were admitted free to the hold, eight in the far end and four in the near end. The hatches were replaced, covered with the tarpaulins, and battened down. Exhaust gas was run in under one hatch for an hour. The hatches were raised, and after the lapse of less than ten minutes the cargo was removed. Of the 12 rats liberated all were found: ten were dead and two collapsed; these recovered later.

These experiments show that rats free even in a loaded lighter are rarely capable of escaping from the lethal action of the gas by sheltering in crevices between the cargo. It appears probable that a slightly longer exposure would have killed 100 per cent. of the rats. Considering that the whole operation in this experiment from the time of commencing fumigation to the time when the labourers started

in the progressive improvement in the dental condition of the 12-year old group. The number of children with four or more decayed teeth in this group has dwindled from 10 to less than 3 per cent., while of the junior scholarship candidates the number requiring dental treatment has fallen from 39 per cent. in 1913 to 7 per cent. to-day. Dr. E. O. Lewis's important investigation into the question of whether enlarged tonsils in children increase susceptibility to infectious disease, and whether susceptibility is decreased by removal of enlarged tonsils, showed the incidence of infectious disease amongst the school population generally to be 28 per cent., while upon those who had had enlarged tonsils removed it was only 4·8 per cent. On the other hand, Kaiser's[1] investigation into the effect of tonsillectomy on the general health of 1200 children in New York, as compared with an equal number of controls during the same period who were not operated on but in whom the indications for operation were the same, showed that the incidence of scarlet fever was not affected, though the severity of the attack may have been reduced.

The charts published appear to dispose effectively of a most interesting hypothetical connexion between the flea and scarlet fever; indeed, on the chart scarlet fever appears to increase as the activity of the Council's cleansing scheme disperses the flea.

That scarlet fever is a throat infection appears to be probable from the results of the Dick experiments and investigations in America, which are disclosing the possibility that an active immunisation of some sort will shortly be available. In this connexion it is interesting to note that not in one of the 230 cases in London certified as suffering from chorea was the disease a sequel of scarlet fever; indeed, Sir William Hamer considers that the relationship between chorea and rheumatism has been somewhat exaggerated in the past judging by the age distribution and the low incidence of cardiac disease among the so-called choreic cases. "The general features of the statistics support the conclusion suggested by the clinical examination of several cases, that there is an increasing tendency to certify as chorea conditions of purely neurogenic character. The substantial increase in the number of girls suffering from chorea is another proof that what hitherto was regarded as simply adolescent instability is now called chorea . . . that there is of late an increase of nervous trouble among children is shown by further analysis of the figures." From 1920 to 1923, 8·21, 7·8, 8·44, and 10·05 per cent. respectively of the out-of-school cases were absent owing to nervous trouble. In 1920 the proportion of out-of-school cases suffering from chorea was only 7·4 per cent., in 1921 it was 8·19 per cent., 9·2 per cent. in 1922, and in 1923 it was 9 per cent. Sir William Hamer considers that many of the cases of chorea would be more appropriately classified under nervous disorders, and puts forward a suggestion that the effect of air-raids on a child of 8 or younger might be the cause of the increase of nervous instability among the adolescent; it is quite possible that the nervous apprehension obtaining in most homes during the war is responsible for such a marked increase in those two sets of figures.

While the number of children from 3 to 5 years of age in the infants' departments of the elementary schools has increased to over 50,000, it is unfortunate that the number of nursery schools in London has remained the same. The Geddes report showed how inadequate was the provision for these children in the elementary schools. Dr. Margaret Hogarth, outlining the differences between the provision made for this group in the two types of school, sums up the fundamental difference in the fact that the amenities of the nursery school approach more nearly that of a middle-class home, but as far as main buildings are concerned, for summer and winter use, "few can be compared with the newer type of elementary school with French windows opening into a sunny playground, a large airy hall, and well warmed cloakroom where wet clothes and boots can be dried. . . The nursery school recognises that personal attention to the requirements of the child is just as important as attention to his mental requirements." There is no doubt that the inadequate provision for the physical and mental requirements of this age group is due to the fact that the teachers employed have had no special training to meet the case. The requirements of children from 2 to 5 years of age differ materially from those of older children, and the question of a proper training for their supervision is equally one for medical and educational consideration. A scheme for the special training of London County Council teachers in this work is needed and would not be difficult to formulate. It is to be hoped that London will see its way to tackle this really urgent question and to remove the unsightly gap which the absence of suitable medical and educational provision for children of 2 to 5 years of age undoubtedly leaves in the County Council's excellent scheme for child welfare and social progress.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 30TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 51: scarlet fever, 1384; diphtheria, 595; enteric fever, 96; pneumonia, 383; puerperal fever, 37, cerebro-spinal fever, 10; acute poliomyelitis, 37: acute polio-encephalitis, 5: encephalitis lethargica, 55; continued fever, 1; dysentery, 9; ophthalmia neonatorum, 107. There were no cases of cholera, plague, or typhus fever notified during the week.

Deaths.—In the aggregate of great towns, including London, there were 6 deaths from enteric fever, none from small-pox, 9 from scarlet fever, 22 from diphtheria, 12 from measles, 20 from influenza. In London itself the diphtheria deaths numbered 8.

Special Articles.

NOTE ON THE DESTRUCTION OF RATS BY EXHAUST GAS.

By D. B. Blacklock, M.D. Edin.,
DIRECTOR, SIR ALFRED LEWIS JONES RESEARCH LABORATORY, FREETOWN;
AND
W. H. Peacock, M.B., B.S. Durh., D.P.H.,
SENIOR SANITARY OFFICER, SIERRA LEONE.

The essentials of a satisfactory agent for the destruction of wild rats are that it should be highly lethal to rats, relatively innocuous to man, devoid of deleterious effects on cargo, furnishings, and fittings, and that it should be cheap and simple in application. The agents at present in use for this purpose—namely, sulphur dioxide, hydrogen cyanide[1] and carbon monoxide as generated by the Giemsa-Nocht apparatus—all fail in one or other of these essentials. We believe that the following experiments demonstrate that in the exhaust gases of the petrol engine we possess ready to our hand an agent which for the destruction of the wild rats comes nearer to the fulfilment of these requirements than any hitherto employed. The petrol used by us was either "Sphinx" or "Tydol," but other brands may doubtless give similar results.

Experiments with Motor-car Exhaust on Rats.

In a Box.—The gas was led from the exhaust pipe of an Overland car of 16–18 h.p., by a length of rubber tubing, through the lid of a box which measured 18 × 12 × 12 inches. Each rat used for experiment was introduced in a small cage into the end of the box remote from the inlet tube. The results are shown in Table I.

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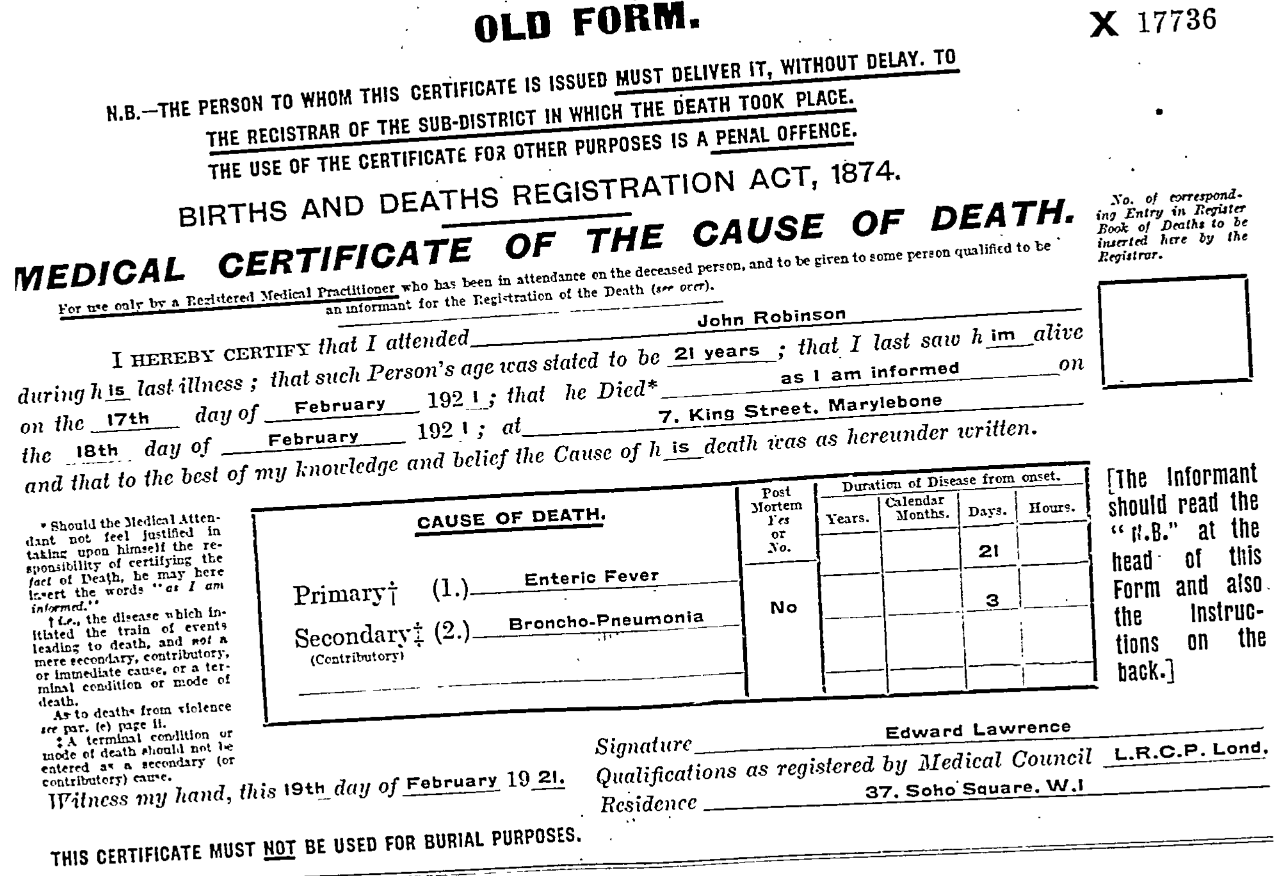
[1] Journal of the American Medical Association, 1924, ii., 33.

[1] Reports on Public Health and Medical Subjects, No. 13, 1923. Preliminary Report on the Use of Hydrogen Cyanide for Fumigation Purposes. By P. C. Stock, C.B., and G. W. Monier Williams.

OLD FORM.



X 17736

N.B.—THE PERSON TO WHOM THIS CERTIFICATE IS ISSUED MUST DELIVER IT, WITHOUT DELAY, TO THE REGISTRAR OF THE SUB-DISTRICT IN WHICH THE DEATH TOOK PLACE.
THE USE OF THE CERTIFICATE FOR OTHER PURPOSES IS A PENAL OFFENCE.

BIRTHS AND DEATHS REGISTRATION ACT, 1874.

MEDICAL CERTIFICATE OF THE CAUSE OF DEATH.

For use only by a Registered Medical Practitioner who has been in attendance on the deceased person, and to be given to some person qualified to be an informant for the Registration of the Death (*see over*).

No. of corresponding Entry in Register Book of Deaths to be inserted here by the Registrar.

I HEREBY CERTIFY *that I attended* John Robinson *whose age was stated to be* 21 years *; that I last saw h*im *alive during h*is *last illness ; that such Person's age was stated to be* 21 years *; that I last saw him alive on the* 17th *day of* February 192 1 *; that he Died** as I am informed *on the* 18th *day of* February 192 1 *; at* 7. King Street. Marylebone *and that to the best of my knowledge and belief the Cause of h*is *death was as hereunder written.*

CAUSE OF DEATH.		Post Mortem *Yes* or *No.*	Duration of Disease from onset.			
			Years.	Calendar Months.	Days.	Hours.
Primary† (1.)	Enteric Fever	No			21	
Secondary‡ (2.) (Contributory)	Broncho-Pneumonia				3	

[The Informant should read the "N.B." at the head of this Form and also the Instructions on the back.]

* Should the Medical Attendant not feel justified in taking upon himself the responsibility of certifying the *fact* of Death, he may here insert the words "*as I am informed.*"

† *i.e.*, the disease which initiated the train of events leading to death, and *not* a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death.

As to deaths from violence *see* par. (e) page ii.

‡ A terminal condition or mode of death should not be entered as a secondary (or contributory) cause.

Signature Edward Lawrence

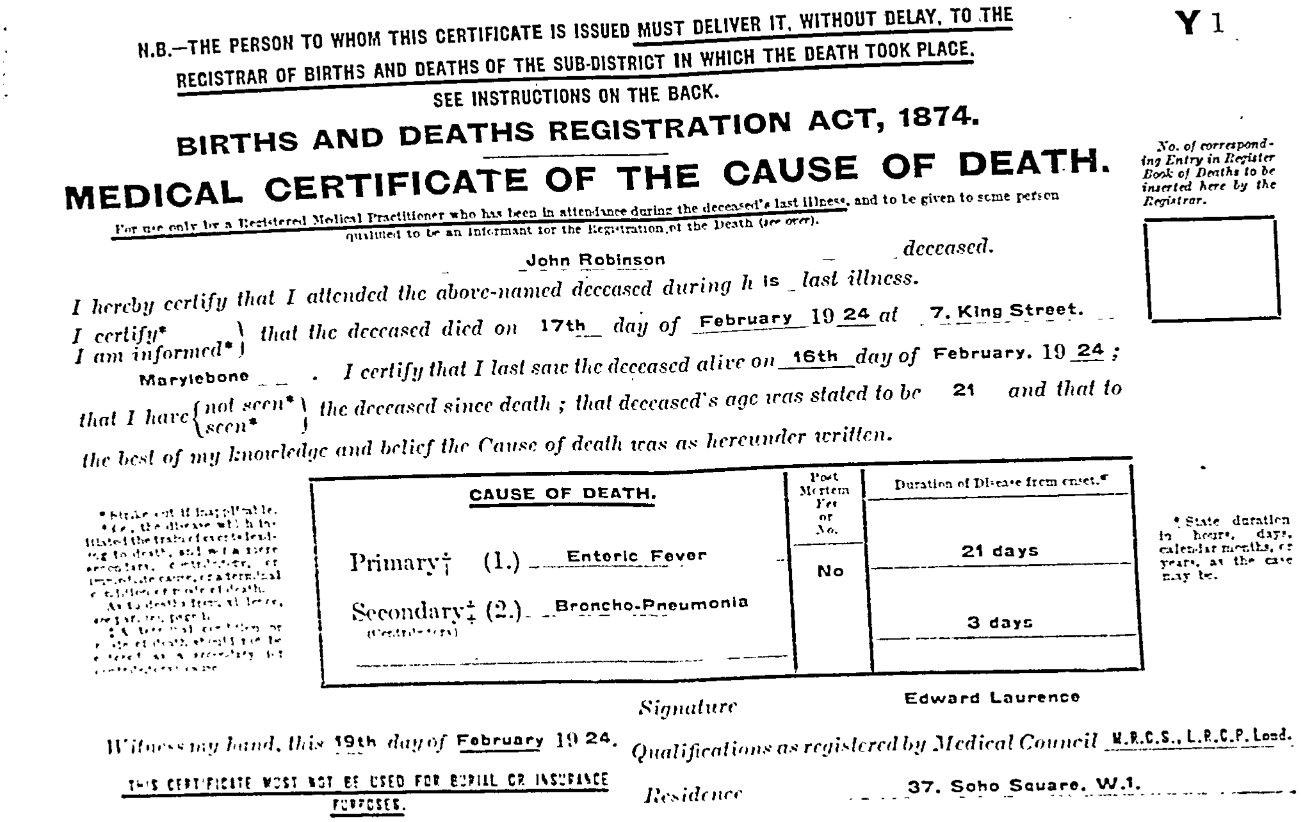
Qualifications as registered by Medical Council L.R.C.P. Lond.

Residence 37. Soho Square. W.I

Witness my hand, this 19th *day of* February 19 21.

THIS CERTIFICATE MUST NOT BE USED FOR BURIAL PURPOSES.

NEW FORM.



Y 1

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SEE INSTRUCTIONS ON THE BACK.

BIRTHS AND DEATHS REGISTRATION ACT, 1874.

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No. of corresponding Entry in Register Book of Deaths to be inserted here by the Registrar.

John Robinson *deceased.*

*I hereby certify that I attended the above-named deceased during h*is *last illness.*

I certify / I am informed** } *that the deceased died on* 17th *day of* February 19 24 *at* 7. King Street. Marylebone . *I certify that I last saw the deceased alive on* 16th *day of* February. 19 24 *; that I have* {*not seen* / seen**} *the deceased since death ; that deceased's age was stated to be* 21 *and that to the best of my knowledge and belief the Cause of death was as hereunder written.*

CAUSE OF DEATH.		Post Mortem *Yes* or *No.*	Duration of Disease from onset.*
Primary† (1.)	Enteric Fever	No	21 days
Secondary‡ (2.) (Contributory)	Broncho-Pneumonia		3 days

* Strike out if inapplicable.

† *i.e.*, the disease which initiated the train of events leading to death, and not a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death.

As to deaths from violence, see par. [illegible], page [illegible].

‡ A terminal condition or mode of death should not be entered as a secondary (or contributory) cause.

* State duration in hours, days, calendar months, or years, as the case may be.

Signature Edward Laurence

Witness my hand, this 19th *day of* February 19 24.

Qualifications as registered by Medical Council M.R.C.S., L.R.C.P. Lond.

THIS CERTIFICATE MUST NOT BE USED FOR BURIAL OR INSURANCE PURPOSES.

Residence 37. Soho Square. W.1.

handling the cargo after opening up only occupied an hour and ten minutes, it appears a very promising method.

A local firm supplied us with a representative series of articles of export and import; these were exposed to the exhaust gases for six and a half hours. The results showed that the gases had no ill-effect on such articles of food as lard, butter, sugar, cocoa-beans, potatoes, flour, bacon, salt, ground nuts, palm kernels, palm oil, onions, and other commodities. No deleterious effect was observed, in texture or in colour, on a large range of cotton, silk, and woollen articles also exposed for six and a half hours to the gas.

Experiments to Test the Penetrating Power of the Exhaust Gas.

These experiments were designed to show whether the gas could gain access to rats concealed in bales and in packing cases and cupboards on board ship or in store sheds.

Rats enclosed in one or in many folds of hessian bags were invariably found dead after one minute's treatment in the experimental box. Similarly rats enclosed in a cardboard box provided only with a slit-like aperture too small for the rats to escape from were killed in one minute. Sugar, flour, ground nuts, salt, rice, bacon, and many other articles are packed in hessian bags. It is clear, then, that this gas possesses great power of penetration, and that rats are not protected from it by any of the ordinary packing methods used.

Effects on Human Beings.

During the whole of the experiments no ill-effect on man was ever observed, although many uneducated natives were employed, and of necessity were somewhat exposed to the gas. The gas which had diffused so thoroughly in one hour as to kill all the rats in the empty lighter and 10 out of 12 in the loaded lighter cleared rapidly when the hatches were removed. When the visible cloud had disappeared from the hold men were able to enter it with safety.

We have unfortunately not had an opportunity of testing the method in large ships, but there seems no reason to suppose that it is not applicable to them. It could be applied by dividing the ship into sections and using several motor launches simultaneously. Indicator rats should in all fumigation work be laid down in remote parts of the place to be treated, and used as tests at opening up before entry.

Summary and Conclusions.

1. The exhaust gas of the petrol engine of a motor-car or launch is very fatal to wild rats, black or brown.

2. It is relatively safe for human beings to work with.

3. It does not damage cargo, fittings, or furnishings.

4. Its use involves no apparatus which is not universally obtainable in any port; it is cheap, easy of application, and rapid in its action.

5. It clears quickly on opening up after application and leaves no unpleasant odour behind.

Acknowledgments are due to Mr. L. White, Messrs. Elder Dempster and Co., Ltd., for placing a launch and lighter at our disposal, and to Captain Pirie and Mr. Henning for much assistance in arranging the details of the experiments. We are also indebted to Messrs. Forbes-Gatherum and McAlister, of the African and Eastern Trade Corporation, Ltd., who kindly undertook to furnish us with samples of produce and goods for testing, and who reported on the effects of the gas on the articles after the tests.

MEDICAL CERTIFICATION OF CAUSE OF DEATH.

ISSUE OF A NEW FORM.

It is exactly 50 years since the Births and Deaths Registration Act of 1874 came into force, and with it the present form of Medical Certificate of the Cause of Death. This form relieved the practitioner from the obligation to certify, as of his own knowledge, the age of the deceased, and no longer required the practitioner to certify the fact of death. The revision of the form of medical certificate has now been taken a little further, chiefly for the purpose of removing certain ambiguities which in practice were found to attach to the old form. A new form has been drafted and will shortly be issued which, while requiring no more information than the old, provides for that information being stated in a more direct and unambiguous manner.

In reference to the form of the statement indicating whether the fact of death is certified by the medical practitioner on his own knowledge or merely reported on the information of the relatives, in the old form this statement and the statement as to the date of death are combined in words running as follows:—

"(I hereby Certify) . . . .; that he died .... on the .... day of .... 19.... ";

while a note to the asterisk states: "Should the Medical Attendant not feel justified in taking upon himself the responsibility of certifying the *fact* of Death, he may here insert the words '*as I am informed*.'"

In the first place, this arrangement places upon the certifying practitioner the duty of writing in the words "as I am informed" in what must be the great majority of certificates given; and it is clear from the certificates received by the Registrar-General that these important words are frequently omitted when they should have been inserted. In the second place, by the linking together of the fact and the date of death, a difficulty is created by reason of the fact that the source of information may not be the same in both cases. The practitioner might have seen the deceased after death and might thus feel justified in omitting the words "as I am informed"; but his personal knowledge need not have extended to the date of death as to which he might have been obliged to accept the statement of the relatives.

In the new form the two statements are separated and the opportunity is given to the certifying practitioner of indicating very simply whether he certifies from his own knowledge or merely reports the statement made to him by striking out one of the alternatives in each pair.

In the old form there were four instances in which the print had to be adapted so as to suit the sex of the deceased (his, her; him, her; he, she). These have been reduced to one; while the removal of the requirement as to the insertion of words and the general straightforwardness of the new form should, it is thought, make it distinctly easier for the certifying practitioner to complete. By the courtesy of the Registrar-General we print on the opposite page the exact text of the new form of certificate, underneath the old form in order to facilitate a comparison.

The remaining small supplies of the old forms in the hands of registrars or of medical practitioners are, we understand, not being withdrawn, so that the new form of certificate will only come into general use as the residual supplies are exhausted.

OLD FORM.

X 17736

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I HEREBY CERTIFY *that I attended* John Robinson *during h*is *last illness ; that such Person's age was stated to be* 21 years *; that I last saw h*im *alive on the* 17th *day of* February *192*1 *; that he Died** as I am informed *on the* 18th *day of* February *192*1 *; at* 7, King Street, Marylebone *and that to the best of my knowledge and belief the Cause of h*is *death was as hereunder written.*

CAUSE OF DEATH.	Post Mortem *Yes* or *No.*	Duration of Disease from onset. Years.	Calendar Months.	Days.	Hours.
Primary† (1.) Enteric Fever	No			21	
Secondary‡ (2.) Broncho-Pneumonia (Contributory)				3	

[The Informant should read the "N.B." at the head of this Form and also the Instructions on the back.]

* Should the Medical Attendant not feel justified in taking upon himself the responsibility of certifying the *fact* of Death, he may here insert the words "*as I am informed.*"

† *i.e.*, the disease which initiated the train of events leading to death, and *not* a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death.

As to deaths from violence *see* par. (e) page ii.

‡ A terminal condition or mode of death should not be entered as a secondary (or contributory) cause.

Signature Edward Lawrence
Qualifications as registered by Medical Council L.R.C.P. Lond.
Residence 37, Soho Square, W.1

Witness my hand, this 19th *day of* February 19 21.

THIS CERTIFICATE MUST NOT BE USED FOR BURIAL PURPOSES.

NEW FORM.

Y 1

N.B.—THE PERSON TO WHOM THIS CERTIFICATE IS ISSUED MUST DELIVER IT, WITHOUT DELAY, TO THE REGISTRAR OF BIRTHS AND DEATHS OF THE SUB-DISTRICT IN WHICH THE DEATH TOOK PLACE.

SEE INSTRUCTIONS ON THE BACK.

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I certify / I am informed** *that the deceased died on* 17th *day of* February *19*24 *at* 7, King Street, Marylebone. *I certify that I last saw the deceased alive on* 16th *day of* February, *19*24 *; that I have {not seen* / seen*} the deceased since death ; that deceased's age was stated to be* 21 *and that to the best of my knowledge and belief the Cause of death was as hereunder written.*

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* State duration in hours, days, calendar months, or years, as the case may be.

* Strike out if inapplicable.

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Residence 37, Soho Square, W.1.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT BRADFORD.

(Continued from p. 516.)

SECTION OF MEDICAL SOCIOLOGY.

FRIDAY, JULY 25TH.

Has the National Health Insurance Justified its Existence?

THE whole of two sessions, morning and afternoon, were given up to the consideration of the answer to this question and the speakers approached the matter from every point of view. The President, Dr. **ARTHUR MANKNELL** (Bradford), introduced the subject by a judicial summary of the various headings involved in a complete answer of the question, without expressing his own opinion.

Representative Opinions.

Sir W. S. **GLYN-JONES** spoke for the insurance committees. He considered that the system had justified itself, but was far from fulfilling the promises made for it in Parliament when it was established. Whilst to the individual the goods had been delivered, the State was still waiting to receive what it had paid for. The preventive features of the Act had been a dead letter, and the National Health Insurance system would not be fully justified until all taking part in it coördinated their efforts in tackling what Sir George Newman described as "perhaps the main part of the health problem of the nation." You could not convert a grudging or incompetent doctor into a keen, tactful, competent practitioner by means of regulations. Too much importance had been attached to paper controls. His recipe would be to provide such conditions of, and remuneration for, medical treatment as would result in practitioners being as anxious to secure and to retain insurance patients as they were to secure and retain private patients. If, in addition, the insured person were educated to recognise efficient treatment, then with the free choice of doctor the rest could be left to the ordinary laws of supply and demand. Now that the profession and the Government were to have a rest from bartering there was some hope that both would take "a long view" and soon be engaged in administering a service of which both would be proud.

Alderman **FRANCIS ASKEW**, J.P. (Hull), spoke for the approved societies. In 1911 the voluntary members of friendly societies numbered 5,000,000. The Act brought into compulsory insurance 15,000,000 persons. The actuarial advice tendered to the authors of the Act had worked out fairly well, including the experiment dealing with the introduction of women workers. Imperfect as the Act and its administration might be in some respects, the insured population would never vote for its repeal.

Mr. **TOM HARLAND** (Bradford), speaking for male insured persons, thought the time would come when dental and optical treatment, convalescent home, and hospital treatment would be definite supplementary benefits for everyone insured. Some societies already gave these benefits. Some doctors gave of their very best in skill and attention, but some gave it rather grudgingly as if they were not well enough paid. He thought the funds of the societies suffered from careless certification. Furthermore, doctors with overcrowded panels should get more assistance in order to avoid long waiting queues. He suggested that all insured persons should be medically examined, say, every five years. [A similar suggestion was made by Dr. Peter Macdonald two days before.] Most insured persons did not visit their doctor early enough.

Miss **FLORENCE GODFREY** (Birstall), speaking for female insured persons, was glad to think that the majority of insured women, of whom all sorts of terrible things were predicted, did the right thing and only applied for benefit when it was needed. The Act needed amending as regards married women and pregnancy. Some women got doctors' certificates and received sick pay during the whole of pregnancy, although doing their household work, while others received nothing but their maternity benefit. Many women were not satisfied with the panel system and said they did not receive as good treatment as did private patients. The complaint was sometimes made that it took the doctor only as many minutes as there were panel patients to give them attention, and in such a case the most ignorant of them knew they were not receiving the treatment they had the right to expect. The regulations as to emergency calls were too stringent. The main special benefit of her society was convalescent benefit and it was of great value. She thought the Act had justified its existence, and, if rightly and sympathetically amended, would do so still more in the future.

Dr. A. E. **BARNES** (lecturer on medicine, University of Sheffield) said he could not speak for consultants as a class, but he had been intimately acquainted with the working of the Act since its conception. He considered that the Act had been one of the greatest advances in administrative medicine in our time. It had brought organisation into what had been chaos. It was a revolution which by means of evolution would eventually become the most important factor in public health. He considered that the panel committees had great opportunities, and in several instances they had shown their interest in research work. The service given by the panel practitioner had improved, and young men were going into the service with avidity. Three of the points for criticism were the prominence given to the bottle of medicine, the increase of neurotic illness, and the lack of a consultant service. He thought these matters could be dealt with by the substitution of a medical treatment fund for the present drug fund, so that the doctor who wished to have consultations, special appliances, or laboratory help could obtain them out of the fund by economising in the doling out of unnecessary medicines.

Dr. G. B. **HILLMAN** (Wakefield) voiced the views of the general practitioner. He enumerated the essentials of a satisfactory medical service. He thought the institution of panel committees had promoted a more cordial and brotherly feeling among practitioners. In his opinion the Act had led doctors to take a wider view of their duties in the direction of preventive medicine. The old pathetic belief in the bottle of medicine was slowly passing away, and more faith was arising in modern methods of examination and greater appreciation of the progressive practice of medicine. Amongst other instances of progressive action on the part of panel committees he mentioned the West Riding scheme for laboratory facilities and the establishment of a prize in clinical medicine at Leeds University.

Mr. H. S. **SOUTTAR** (surgeon, London Hospital), speaking on behalf of the voluntary hospitals, said there were misgivings when the Act came into force as to its possible effect on the income of the hospitals and the number of their patients. At the London hospitals they found that the number of out-patients had diminished. Practically speaking, out-patients were only seen on a letter from the panel practitioner to whom an answer was sent in due course. The figures showed that the hospital was not being swamped by patients who ought to be treated by their panel doctor, and that in the second place the serious cases sorted out by the panel practitioners were able to receive more careful attention. If in the future the scope of the Act was enlarged so as to extend its operation to dependents and to include hospital treatment among the benefits, hospitals would be still further relieved of minor cases and the consultative value of their services increased. Interchange of information between the consultant and the general practitioner would become a matter of routine; the early reference and admission of serious cases would be assured; and along these lines there would be developed a great health service strong in the fight against disease and in the interests of the country.

Mr. J. J. Barron (secretary-superintendent, Bradford Royal Infirmary), speaking for the administrative side of the voluntary hospitals, said that since the establishment of the Act at the Bradford Royal Infirmary there had been, as in the case of the London Hospital, a decline in the number of out-patients but a considerable increase in the number of in-patients. As the main items of hospital expenditure are incurred in the in-patient department, he thought the hospitals might fairly ask from the approved societies and the insurance committees the costs to which they were put in dealing with insured in-patients.

Dr. J. J. Buchan (M.O.H., Bradford) thought the National Health Insurance Act had justified its existence from the point of view of preventive medicine. Panel practitioners were now directly interested in the environment of their patients, and since the passing of the Act he had received more reports from medical practitioners with regard to bad environment. By the passing of the Act 16,000,000 people had been encouraged to regard illness in all its stages as worthy of consideration and to seek medical treatment at the onset, when it was more likely to be effective. Most insurance committees had done something in the direct education of the public in health matters. Special efforts had been made against certain diseases—e.g., tuberculosis. Lastly, medical benefit had been a great effort to ameliorate disease among the sufferers and to mitigate its after-effects. During the first ten years, owing to the encouragement of a greater care of the sick, there might be an apparent tendency towards increased sickness, but over a longer period we should find a marked decrease, and with this decrease a greater efficiency of each unit in industry.

Discussion.

Dr. Harold Beadles (West Ham), speaking as chairman of an insurance committee, said the scope of the Act must be widened by the inclusion of dependents and persons who at present came under the Poor-law. He would like to see the work put under committees of the county councils and county boroughs and the same benefits arranged for sickness, accidents, unemployment, old age, &c., all on a contributory basis. We spent £280,000,000 per annum at present on social schemes, and he did not think a comprehensive insurance scheme such as he had mentioned would increase the cost.

Dr. J. F. Walker (Southend-on-Sea) said there was still a suggestion of slight about the term "panel doctor." The medical service subcommittee was not quite satisfactory. He thought a panel medical court of honour would be more effective. The delay in granting sickness benefit frequently gave rise to criticism. It was often necessary to give a bottle of physic in order to get other advice acted upon.

Dr. Herbert Jones (M.O.H., Herefordshire) thought panel practitioners might call in the medical officer of health more than they did. He found it a great advantage himself to be on the panel committee for the county.

Dr. G. W. Skene (Willesden) said that general practitioners were not unanimous in supporting the panel system. The reason was not financial but arose from irritating features of administration. The whole of the profession ought to be brought in if possible.

Mr. W. Gill, J.P. (Manchester Unity of Oddfellows), said the approved societies as well as the doctors had to put up with administrative irritants. A medical service subcommittee composed of doctors would not answer. It must be two-sided. Insurance committees had lost the most interesting part of their work in tuberculosis. It would be a mistake and dehumanising to transfer the work of insurance committees to county and borough councils.

Dr. Peter Macdonald (chairman, York Insurance Committee) said medical men were dead against the Act in 1912, but now, in the words of Dr. Stancomb, "it would take a high explosive to blast them out of it." Speaking as a member of an insurance committee, he believed that the panel practitioners mostly did their work well. Contract work had given a value to preventive work by the general practitioner.

Dr. G. H. Sedgwick (Rotherham) said that if the Act were to justify itself it must be made complete. Every general practitioner must be got on to the panel and the invidious distinction between the "family" doctor and the "servants'" doctor done away with.

Dr. J. W. Bone (Luton) thought those who gave the service were as a rule satisfied. In some places like Bournemouth fees were too high to make panel practice worth while. He did not think insured persons were quite satisfied. The friendly societies' institutes did not have free choice of doctor. Insured persons did not like the double wait at the doctor's and the chemist's. The delay in giving sick pay also caused dissatisfaction. Some agents of friendly societies sometimes made difficulties in order to persuade persons to join their particular societies.

Dr. C. Buttar (London) said they should get rid of lay control. Medical benefit should be separated from sickness benefit and put under the Ministry of Health. Discipline should be entrusted to committees of the medical profession.

Mr. C. J. Bond (Leicester) said the Insurance Act was a great step forward. In contrast with the London Hospital and Bradford Infirmary out-patients at Leicester were now nearly pre-war in numbers. Fifty thousand patients were now waiting for beds in the county and an increased hospital service was greatly needed.

Dr. E. W. G. Masterman (medical superintendent, Camberwell Infirmary) said the London Poor-law hospitals treated more patients than the London voluntary hospitals and that 95 per cent. of their patients were sent in by panel practitioners. They had no waiting list and never refused a patient. The Poor-law hospitals must be linked up with the general medical service.

A Summing Up.

Dr. H. B. Brackenbury (London) endeavoured to sum up the discussion. He thought the figures for out-patients in Leicester were exceptional and that the figures for the London Hospital and Bradford Infirmary were the rule, indicating that panel practitioners were not shuffling off their patients on to the hospitals. Panel practitioners were evidently contributing to preventive medicine by drawing attention to environment when it was bad. The insurance system was agreed to have justified itself by all the speakers. It was an encouragement of thrift, and all the speakers included its extension in their programme. He agreed that medical benefit should become part of the enlarged health service of the country, and should be separated from the cash benefit. It was not clear why all general practitioners did not go on the panel. He did not think disciplinary control could be handed over to the doctors, although ideally it might be better to do so. Professional honour was a better guide than regulations. A great extension in the insured population was needed by the inclusion of 30 millions of dependents. He was not afraid of the profession becoming commercialised by the payment of the present honorary staff of hospitals. Insurance committees cannot deal with public health matters on behalf of a section of the population only, and when the insured population was extended the work of the insurance committees would need to be transferred, but their clerks and officials would still be required. Compulsory physical examination of insured persons at stated intervals could not be enforced, and he doubted if voluntary examination would be much use. He believed that loose and imperfect certification by panel practitioners was quite rare and that the difficulties of exact certification were not understood by the layman. In order to provide for thorough medical work with a due regard for the preventive aspect it might be a good plan to increase the capitation fee.

A FORECAST OF THE MOTOR SHOW.

Improvements in 1925 Models.

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The motor show opens at Olympia on Oct. 15th. Since the popularisation of motoring this annual exhibition of new models and accessories has become a function of importance to all classes of the public, and there is reason to anticipate an even larger attendance than last year. Certain innovations which have proved successful on a few 1924 cars have now been much more generally adopted; actual reductions in price are not to be looked for in many cases, but since certain accessories, formerly costly extras, are now included as standard equipment, the 1925 cars complete for the road will be a better proposition than were the 1924 models.

Outstanding Features.

Balloon tyres, four-wheel brakes, and cars completely equipped with accessories are likely to be the outstanding features of the show, and the advantages of their adoption are worth consideration.

Balloon tyres mean easy riding over rough roads, with consequent elimination of severe shocks on the chassis. If tyres have to be changed they are much easier to put on than the ordinary type, and certainly less laborious to pump. Side-slips are, to a certain extent, minimised. It is, of course, quite possible for cars fitted with ordinary type tyres to be converted to low pressure ones at a cost varying from £15 upwards, according to size. It is important to remember that the whole secret of the successful use of balloon tyres lies in maintaining the pressure exactly as specified by the tyre manufacturers, and for this purpose a simple and inexpensive gauge, of the type shown in Fig. 1, should be carried by every motorist for periodical testing.

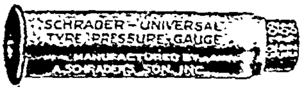

Fig. 1.—Tyre pressure gauge.

Four-wheel Brakes.—These will be standardised on many cars or can be fitted at an extra cost varying from £10 to £50. These brakes should be of great benefit to doctors whose journeys are confined largely to highly polished tarred roads or setts, where risks of skidding are great. With four-wheel brakes it is not easy to make a car side-slip, and when used for the first time a comfortable sense of security is experienced.

Accessories.—Such accessories as a petrol gauge, windscreen wiper, or driving mirror can be looked for as standard equipment on most cars.

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Owing to the great advance made during the past year in all-weather equipment for touring cars, the coach-built all-weather type of body is becoming less popular. This is hardly surprising, since the old type of coach-built all-weather body with wooden pillars is a constant source of trouble. Its liability to rattle and the expense of keeping in good condition has been much complained of. The "Gwynne" or "All Steel" type of cabriolet is likely to remain popular. It is considerably more expensive than a touring body, but it offers the advantages of an open touring car combined with those of a completely enclosed one with glass windows. In contrast with the coach-built type, there are no rattles, and its lasting qualities are good. The appearance of both types of cabriolet body is shown in Figs. 2 and 3. However, the types of car most likely to be in demand this year are: (*a*) the saloon with and without partition, and (*b*) the touring car with first-class all-weather equipment. If this equipment is made on up-to-date lines and by a good coach-builder it is practically wind and waterproof, and has the advantage of being put up and down in two or three minutes. Another type of car very

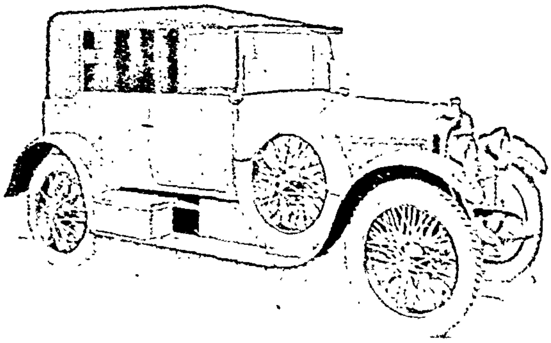
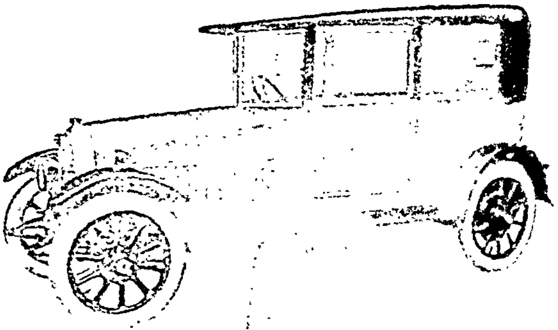


Fig. 2.—A cabriolet with a "Gwynne" head.



Fi . 3.—A cabriol h-built head.

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and paintwork can be entirely dispensed with. It has been found quite durable, and in the event of an accident, easily renewable. To clean these bodies it is only necessary to sponge them over and dry off. Recently new developments of this idea have come to the front, one of which is termed the "Jazz" (see Fig. 4). The body is first covered with fabric and this is afterwards treated with coats of celluloid and varnish, the result being a durable and unusual finish not easily scratched. Fabric can be used with intricate or elaborate patterns in colour, according to the taste of the owner. The new process is slightly less costly than good paintwork and does not crack or blister. Bodies which have been treated in this way and have been on the road for nearly a year show small signs of wear.

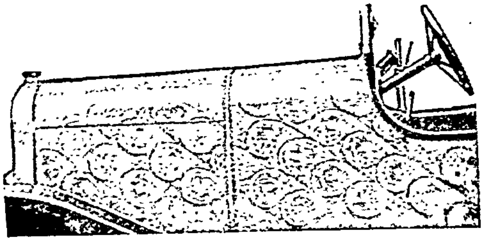

FIG. 4.—A "jazz" finish celluloid and varnish over fabric.

How to Look at the Show.

As a result of many years' experience of the shows I have come to the conclusion that it is quite futile for one with a "will to purchase," and not much time to spare, to go to the show with the idea of looking round generally and coming to some decision. He may study many different makes, and each one as he goes on seems to present something better than those he has previously seen, until at the end of one or two days he is hopelessly befogged. It is much better to study quietly the makers' descriptions of a few cars in which he may be interested, and go with the object of seeing these and decide on their respective merits. If he is not a really experienced motorist, it is advisable to consult an independent expert before coming to a decision. Of course, if he wishes just to nose round the show as if he were at a horse show he can spend a very joyous day doing so. Even if he obviously does not mean business, the many questions which occur to him during his perambulations are usually answered with extreme courtesy by the salesmen on the various stands. But should some lack of interest be apparent at busy times, it must not be forgotten that the questions of would-be purchasers are likely to lead to more business than desultory inquiries from men generally interested in motor-cars, and some toleration should be shown. One of the most important points the would-be purchaser should keep in mind is that because a car is cheap in price it is not necessarily made of inferior quality material, and the workmanship embodied need not be inferior to that on higher priced cars. It should be remembered that at the present day the small low-priced car is produced in large numbers in works equipped with modern labour-saving machinery. The greater the output the better the finished article is true in many cases, since material must be purchased in huge quantities and the very best type of up-to-date automatic machinery must be used. I always find, however, when advising doctors as to the purchase of any car, that so many personal and professional factors have to be taken into account that it is almost impossible to generalise and each case has to be considered separately.

The show arrangements are on much the same lines as last year—the main hall and coach-building annexe, the new annexe, where cars as well as accessories will be shown, and the usual two public entrances, i.e., Hammersmith-road and Addison-road. There is ample space for the parking of private cars in neighbouring streets, such as Blythe-road and Russell-road, and cars can be left there with safety.

Correspondence.

"Audi alteram partem."

DIABETIC COMA IN INSULIN-TREATED DIABETES.

To the Editor of THE LANCET.

SIR,—Much has been published during the last 12 months on the technique of insulin treatment in diabetes. I have, however, seen very few records of cases of coma treated with insulin, although these cases present very special difficulties both of diagnosis and treatment. On the one hand, intercurrent infection is probably the commonest precipitating cause of coma—more especially in patients already on insulin, and the detection of the source of infection in coma may be exceedingly difficult. On the other hand, there is no time in coma for the graduated administration of insulin, and even with blood-sugar estimations it is not an easy matter to gauge the amount of insulin required. Moreover, it is probably not generally recognised what very large doses of insulin may be needed in this condition.

The following cases illustrate both the difficulties referred to above:—

CASE 1.—A girl, now 9 years old, had suffered from a severe type of diabetes for 18 months before commencing insulin. This had been started in May, 1923, when she was almost moribund; and after a long period of observation in hospital she had been discharged on a diet of 900 calories and a dose of 30 units of insulin daily, given in two injections before the morning and evening meals. Except for an attack of broncho-penumonia in January, 1924, she had remained in good health ever since, had fully regained her weight, and was attending school. Her blood-sugar had been estimated at fortnightly intervals during the year and had nearly always been below 0·17 per cent. in the afternoon. She attended the hospital on April 24th last for this purpose, when her blood-sugar was 0·11 per cent. at 4 P.M. The following day she complained of headache, her temperature rose to 102° F., and she refused to take any food. Her mother therefore discontinued the insulin, since she was fully alive to the danger of hypoglycæmia, and thought that the insulin must be stopped if no food was taken. The temperature remained high on the 26th, and she began to vomit in the evening. When seen on the morning of the 27th the vomiting had become almost constant, but there was no pain in the stomach. There was marked hyperpnœa, with an expiratory grunt suggesting pneumonia and the alæ nasi were working. At the right base there was a very definite pleuritic rub. The breath smelt strongly of acetone and the urine contained large amounts of sugar and acetone. She was ordered 60 units of insulin in the day. At 6.30 P.M. she was drowsy and still vomiting. The temperature was normal. The blood-sugar was 0·47 per cent. When seen by her doctor (Dr. C. McCay) at 10 P.M. she had just become unconscious. She was given another 20 units of insulin, making 80 units since 9 A.M., and brought by car to the hospital. On arrival at the hospital she had regained consciousness; her blood-sugar then was 0·4 per cent. A further 60 units of insulin during the night reduced her blood-sugar to 0·11 at 9.30 the following morning. Thereafter she received 40–50 units insulin daily. On examination on the morning after admission her breathing was natural and no abnormal physical signs could be found in the chest; the pleuritic rub had entirely disappeared. She was still drowsy, however, and her mental condition was very peculiar. On the following day (29th) she showed signs, for the first time, of a commencing facial erysipelas, and with its appearance the mental condition became normal. The erysipelas ran a normal course of five to six days' duration, with a high temperature and with one short relapse; but it was only possible gradually to reduce the insulin, some time after the temperature had fallen to normal, from 40–50 to 35 units daily. She is now (August, 1924) quite well again, except for the fact that she requires about 8 units more insulin daily to keep her blood-sugar within normal limits on the same diet as before.

This child therefore required 140 units of insulin in 24 hours to restore her blood-sugar to a normal figure; and the acidosis apparently persisted for some time after the blood-sugar had reached a more or less normal figure. When first seen, her condition

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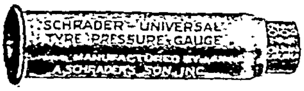

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Accessories.—Such accessories as a petrol gauge, windscreen wiper, or driving mirror can be looked for as standard equipment on most cars.

Considerations of Price.

Reductions in prices of medium and higher priced cars can hardly be anticipated, principally because these prices were more or less stabilised when the McKenna duties were taken off on August 1st. The majority of makers of smaller or lower priced cars have issued their new prices, and these show certain reductions. There is a strong possibility of continental and American prices being raised in the near future: in fact, one or two American makers have already decided on this step.

The broad question as to whether to buy an expensive car designed to last some years, or an inexpensive one to be replaced after, say, two years, is a point that can only be decided in relation to a doctor's special circumstances. Obviously, in a better-class practice it is desirable to run a better-class car, which cannot economically be disposed of until it has given five to eight years' use. In no case is it wise to contemplate exchanging a car until it has run approximately 15,000 miles. We are frequently asked whether, when the purchase of a new model being contemplated, negotiations as to the disposal or exchange of a second-hand car should be hurried on before the show. This is quite unnecessary, since between now and October values in second-hand cars are unlikely to change.

Fashions in Bodies.

Owing to the great advance made during the past year in all-weather equipment for touring cars, the coach-built all-weather type of body is becoming less popular. This is hardly surprising, since the old type of coach-built all-weather body with wooden pillars is a constant source of trouble. Its liability to rattle and the expense of keeping in good condition has been much complained of. The "Gwynne" or "All Steel" type of cabriolet is likely to remain popular. It is considerably more expensive than a touring body, but it offers the advantages of an open touring car combined with those of a completely enclosed one with glass windows. In contrast with the coach-built type, there are no rattles, and its lasting qualities are good. The appearance of both types of cabriolet body is shown in Figs. 2 and 3. However, the types of car most likely to be in demand this year are: (*a*) the saloon with and without partition, and (*b*) the touring car with first-class all-weather equipment. If this equipment is made on up-to-date lines and by a good coach-builder it is practically wind and waterproof, and has the advantage of being put up and down in two or three minutes. Another type of car very useful for professional purposes only is the two-seater coupé with dickey.

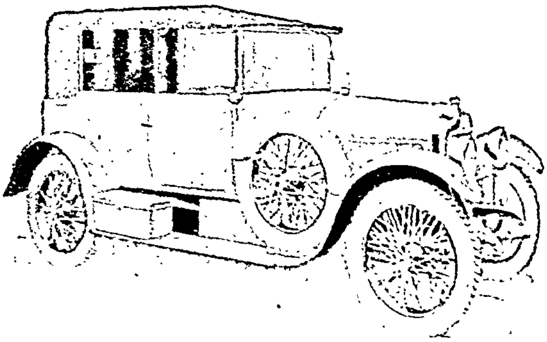

Fig. 2.—A cabriolet with a "Gwynne" head.

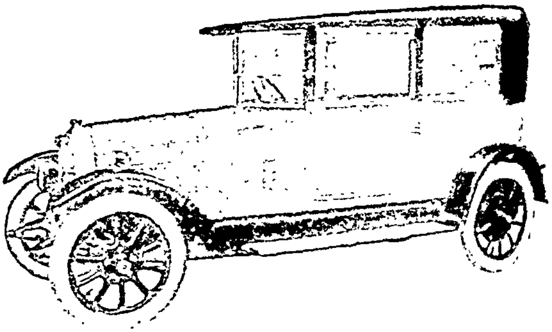

Fig. 3.—A cabriolet with a coach-built head.

The so-called "Chummy" (or "occasional four-seater") bodies seem to be less popular, since the rear seats of this type of body are extremely uncomfortable, and the two-seater with dickey is returning to favour. Although the occupants of the back seat are not under cover, this disadvantage is more than counterbalanced by the extra comfort obtained when it is not raining.

New Fabrics for Body Work.

Many small or medium powered cars will have bodies panelled with fabric leather in place of metal or plywood panels. This type is commonly called the "Weymann," after its original inventor. It has many advantages over the ordinary body, in that it can be made very light, has no creaking joints or drumming.

may be claimed for it of counterbalancing a purely calorimetric standard of food values. a safeguard of diminished importance since the discovery of vitamins. It seems, indeed. not impossible that the belief may rest upon an empirical knowledge of the value of fresh food and. if this be so. it might be compared to a rough paraphrase of the theory of vitamins in terms of magic and the very form of the word "vitamin" may have reinforced the popular idea that life is inherent in food. making the new discovery all the more readily acceptable as the scientific confirmation of a vague or unconscious belief. It is interesting as an example of the development along different lines of an idea that is possibly rational at bottom to compare the neurotic fantasies of the patient with the prescription of Paracelsus for manufacturing an "homunculus" by the magical "digestion" of bread and wine, and these end-results with the religious aspect of the idea in the Laws of Manu, which instruct the pure Brahmin to worship the food that he eats "because food is the life."

Some emphasis has been laid on the general character and prevalence of the patient's idea that life is inherent in food because it seems likely that it plays a part in many minor antipathies. such as would commonly be regarded as meaningless eccentricities or imputed to a delicate digestion, yet might prove explicable and susceptible of correction. One slight example may be given in the case of a young married woman, in no way neurotic, who had a horror of biting into any fruit, such as gooseberries, grapes, or stewed cherries, whose contents were semi-liquid. The feeling was carried back to childhood and the memory of stepping on gooseberries lying under the bushes, then to stepping on an egg, and the repugnance was found to be due to the idea that she was "destroying life."

I am, Sir, yours faithfully,

F. A. HAMPTON.

Queen Anne-street, Cavendish-square, W., Sept. 2nd, 1924.

AMMONIA AND CHLORINE IN THE DISINFECTION OF WATER.

To the Editor of THE LANCET.

SIR,—I have noted with interest the annotation in your issue of August 23rd on the effect of ammonia on the chlorination of water as reported by Major C. H. H. Harold and Captain A. R. Ward, and since then I have had an opportunity of reading the original article as published in the *Journal of the Royal Army Medical Corps*. As I was responsible for the introduction of the chloramine process for water purification, perhaps I might be permitted to make a few remarks on the results obtained. After I had confirmed Rideal's observation that ammonia increases the germicidal effect of bleach solutions,[1] the details necessary for the successful application of the process on a large scale were worked out,[2] and it was adopted by Ottawa, Canada, for the treatment of the whole supply of 20 mill. imp. galls. per diem. It has also been used successfully at Denver, Colo., for the prevention of aftergrowths, and I believe that it has been used by Diénert in Paris.

When the process was still in the experimental stage I realised that a combination of chlorine gas and ammonia would be an almost ideal combination in many respects, but laboratory experiments showed that the tendency was for the formation of ammonium chloride which has no germicidal value. The research department of Messrs. Wallace and Tiernan, New York, studied this combination, and it was tried out in Ottawa in 1919. The results, however, were so inferior that it was decided to revert to the former mixture of bleach and ammonia. I also used ammonia and bleach in experimental work in the Vladivostock area in 1918, but owing to the possibility that *E. histolytica* might be present, it was not considered advisable to use this process for the sterilisation of the water-supply of the troops as there is no experimental evidence as to the effect of chlorine compounds on these organisms.

The disparity between my results and those of Harold and Ward might be due to the use of autoclaved water by the latter, whilst I used untreated fresh water containing a relatively large amount of colour (80 p.p.m. Pt-Co scale). The treatment of a natural water by heat under increased pressure would result in a definite increase in the pH due to the loss of free and half bound carbonic acid. The resulting slight alkalinity would produce some hypochlorite on the addition of chlorine gas, or its aqueous solution, and the conditions would then be favourable for the formation of chloramine. The same condition would also retard the velocity of the action of the bleach solutions.

Before any scheme involving a combination of ammonia and chlorine gas is tried out in the field I would suggest that experiments should be made with waters at their natural pH and also that the conditions, found by practice on a large scale to be the most favourable for bleach and ammonia, should be tried out. In my opinion the chloramine process is essentially one most suitable for small doses and long contact periods. Short contact periods are often essential in military work, and in this case it would appear desirable to follow the suggestion of Sir Alexander Houston (Reports to Metropolitan Water Board) of using super-chlorination followed by de-chlorination. This process was used to some extent during the war, but its possibilities do not appear to have been developed to the full extent.

I am, Sir, yours faithfully,

JOSEPH RACE.

Devonshire Hospital, Buxton, Sept. 2nd, 1924.

ANTHELMINTICS.

To the Editor of THE LANCET.

SIR,—On reading the very interesting leading article on anthelmintics in your issue of July 19th it occurs to me that a little more might be added in the presentation of this subject. For one thing, your surmise that the error in the work of Hall and Hamilton on the anthelmintic constituents of chenopodium was due to distillation at insufficiently low pressure is apparently correct. This is the conclusion recently arrived at by my colleague, Mr. Hamilton, after a conference on this subject with Dr. Nelson of the Bureau of Chemistry of the United States Department of Agriculture, and a comparison of the work with that of Dr. Nelson.

As regards carbon tetrachloride, the question of safety brings to light a somewhat unusual condition. Carbon tetrachloride appears to be a drug which has no minimum lethal dose. It has been given in hundreds of thousands of human cases—over a hundred thousand in Fiji alone—and has been given to scores of dogs experimentally and to many thousand in veterinary practice. Ordinarily dogs will tolerate enormous doses, up to 25 c.cm. per kilo (or 83 times the therapeutic dose of 0·3 c.cm. per kilo of 100 per cent. effective action against hook-worms), without evident bad results. Human patients have taken as much as 50 c.cm. in the course of a few consecutive days. Deaths among human beings and among dogs and fur foxes have in almost all cases followed the administration of a therapeutic dose. On the other hand, chenopodium has a safety factor of only five on the basis of the therapeutic dose for removing ascarids from dogs (0·1 c.cm. per kilo) as compared with the minimum lethal dose of 0·5 c.cm. per kilo, or a safety factor of only 2·5 on the basis of a moderately effective (much less than 100 per cent. effective) dose for removing hook-worms from dogs (0·2 c.cm. per kilo) as compared with the minimum lethal dose.

The extreme tolerance of dogs and man for carbon tetrachloride in the great majority of cases suggests was strongly suggestive of a commencing pneumonia. The erysipelas did not manifest itself until four days after the commencement of her illness, and its relation to the initial symptoms remains doubtful.

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[1] THE LANCET, 1916, ii., 71.

[2] Journ. Amer. Waterworks Assoc., 1918, v., 73.

CASE 2.—A married woman of 35 was seen on two occasions in January, 1924, in consultation with Dr. D. B. Spence, to whom I am indebted for the records. As the patient lived many miles away it was impossible to carry out regular blood-sugar estimations. This patient had had diabetes for between one and two years before commencing insulin in April, 1923, under the care of a London consultant. She was stated actually to have been in coma when insulin was started. For nine months she had been on a fairly strict diet, with 20 units of insulin daily. She had gained half a stone in weight, and had apparently been passing sugar at intervals during this period. For several weeks before I saw her she had been feeling depressed, and for six days had suffered from obstinate constipation. Five days previously she was said to have "caught a chill," but had not been seen by her doctor until the previous day, when insulin had been stopped for 24 hours, and she was already on the verge of coma, with drowsiness, deep breathing, and marked polyuria and glycosuria. When examined at midday on the 27th, although she had had 40 units of insulin since the previous evening, she was already in coma. The temperature was below 96° F., with a feeble pulse and marked hyperpnœa. At both bases there was a very well marked friction rub. The abdomen was distended and resistant; the bowels had been opened with an enema on the previous day for the first time for three days. The blood-sugar was 0·46 per cent., and the ferric chloride test for diacetic acid in the urine was strongly positive. She was given 140 units of insulin during the next 18 hours. This had the effect of bringing her out of coma. But on the 28th there was some sweating, she again became semiconscious, and there was very little secretion of urine containing no sugar. She was therefore judged to be hypoglycæmic, and the administration of insulin slowed down. On the morning of the 29th the breathing had again become deeper, and there was slight glycosuria; she was given 40 units of insulin during the day.

When I saw her for the second time on the afternoon of the 30th she was completely comatose, although she had received 140 units of insulin since 1 A.M. A catheter specimen of urine showed a trace of sugar and a well-marked ferric chloride reaction. The blood-sugar was 0·16 per cent. For the past three days the temperature had varied between 98° and 100°, and the pulse between 90 and 120. There was now consolidation of the right lower lobe and friction at the left base. From this time on she became progressively worse. Insulin was discontinued the same evening, and she died in the early morning of Feb. 1st, with a terminal pyrexia of 105°. During her illness she had on an average two pints of fluids daily by the mouth and numerous rectal salines; and during the four days of intensive insulin treatment she received 400 units of insulin. Almost at the end of this period her blood-sugar was 0·16 per cent.

It may be urged that no patient on insulin should ever be in danger of coma. But insulin is now in very general use, and a large number of patients become so habituated to it that they tend to lose contact with their doctor. When it is realised how swift may be the onset of coma, especially having regard to the very large amount of fat in the average diet of the patient on insulin, it is not altogether surprising that such accidents should happen from time to time.—I am, Sir, yours faithfully,

W. T. COLLIER, *M.C.*, M.D. Oxf.,
M.R.C.P. Lond.

Oxford, August 26th, 1924.

DYSPEPSIA OF MENTAL ORIGIN.

To the Editor of THE LANCET.

SIR,—The neurotic patient is so commonly eccentric and fastidious in diet that it seems natural to accept the attitude as inevitable to the peculiar temperament of the patient, but the following extreme example, though it does not bring to light any new ætiological factors, seems worth recording, since it shows that, in some cases at least, the apparent waywardness may be the result of a logical train of thought of a kind not peculiar to morbid psychology.

The patient, an unmarried woman of 35, had suffered for some 15 years from a feeling of distension, nausea, and palpitation of the heart occurring immediately after meals. The symptoms were apparently those of an organic dyspepsia, but on close questioning it was found that they were only evoked by certain articles of food which at first sight seemed to have nothing in common. Any food that was coloured red, especially tomato soup or red gravy, salads, raw fruit, all root vegetables, eggs, and, in general, any food that was uncooked or underdone brought on the symptoms. The symptoms also occurred if she were breathed upon by a man, so that a visit to the dentist was invariably followed by a sharp attack.

On thinking over the symptoms the patient discovered that they stood to her for the chief symptoms of pregnancy, especially the feeling of distension, which often compelled her to loosen her clothes. She then revealed that she was often greatly worried by the fear that she was pregnant, although she realised that it was irrational and fantastic. The connexion between certain articles of diet and pregnancy had been formulated, unconsciously, in the following way. She knew, as quite a small child, that babies grew inside their mothers and she supposed that they grew out of the food that was eaten,[1] but observing that they did not occur promiscuously, she argued that some special sort of food must be necessary to start the process of growth. A warning not to eat watercress, since it might contain frog's eggs which would "grow inside her," seemed to provide a clue, and she thought that any food that contained life might cause pregnancy, hence her fear in later years of uncooked food, and especially of watercress and salads. Learning from the Old Testament that the Jews were forbidden to eat meat with the blood in it because "blood is the life," she assumed that the prohibition was imposed to prevent people in general from becoming pregnant, a theory that determined her reaction to underdone meat, tomato soup, and to all food that in any way resembled blood. The story of Rachel and the mandrake root accounted for the power of all root vegetables to bring on the imagined symptoms of pregnancy, and the phrase "God breathed the breath of life into Adam" for her reaction when she was breathed upon by a man.

It will be noted that the patient's mode of thought was quite logical and led, in accordance with the limited data at her disposal, inevitably to the fantastic conclusions that were expressed in the neurosis. Two pieces of folk-lore (the mandrake root and the "breath of life") were accepted with the characteristic readiness of a child and built up into her fantasies, while a close parallel to the rest of her behaviour towards food may be found in many primitive practices and superstitions. Among the Esquimaux of Baffin's Land the young girls are forbidden to eat eggs lest they conceive, and among the Coast-Salish Indians of N.W. America certain meats are proscribed for the same reason.[2] Blood itself is very commonly used in folk medicine as a remedy for barrenness. But examples of the use of magic food as an agency in conception may be found in modern times and nearer home, and Hartland records the case of a young married woman who stole some sausages in 1876 from a shop in Theobald's-road and ate them raw on the spot in order to have a child, with the result, as she related, that nine months later to a day a boy was born who was "fat and rolly like a sausage." It is interesting to notice that this story curiously resembles a dream, much as the tabus of the Esquimaux and the North American Indians resembles a neurosis.

Although the conclusions reached by the patient in childhood, and repeated later in her neurosis, are also found among primitive people, it does not seem necessary to invoke any stirrings of ancestral memory to explain the coincidence, seeing that both the child and the primitive are alike in their relative ignorance of the physiological processes, and may, therefore, be expected to arrive at similar results if they argue from similar data.

The general idea that food contains life, and that the vital energy of the plant or animal from which it was derived is not quite extinct, but can be directly imparted to the individual who eats it, was developed intensively by the patient and employed in the construction of her symptoms. But the idea seems to exist, in a hazy way, as a popular belief, if we may judge from the obstinate faith in the food value of dietetic beef-tea, &c., and the recurrent popularity of régimes dictating unfired food or raw meat. As a quasi-magical attitude towards food the general idea has obvious drawbacks, but the advantage

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[1] Ernest Jones: Papers on Psycho-Analysis, p. 497.

[2] Hartland: Primitive Paternity, i., 57 et seq.

Obituary.

SIR ANDREW JOHN HORNE, F.R.C.P. IREL.

Sir Andrew Horne, joint Master of the National Lying-in Hospital, Dublin, died on Sept. 5th at his residence, Merrion-square, Dublin, at the age of 68, after a long illness. He had been for many years one of the leading obstetric and gynæcological physicians in Ireland. Born in Ballinasloe, Co. Galway, Horne spent his schooldays at Clongowes Wood College, Co. Kildare, proceeding to Dublin and Vienna for his medical training. He became a Licentiate of the Royal College of Surgeons in Ireland in 1877, and a Fellow of the Royal College of Physicians of Ireland in 1885. Of the latter College he was Vice-President from 1894 to 1896, and President from 1908 to 1910. He early devoted himself to the special study of obstetrics, and was assistant Master of the Rotunda Hospital from 1880 to 1883. On the foundation of the National Lying-in Hospital in 1894 Horne was chosen as Master, a position he continued to hold up to his death, though in recent years a joint Master shared the duties. At the close of his period of presidency of the Royal College of Physicians he was knighted by Lord Aberdeen, then Lord-Lieutenant of Ireland.

During his long career in the profession Horne was a steady and conscientious worker, and for many years he enjoyed a large practice. He took much interest in the work of the Section of Obstetrics of the Royal Academy of Medicine in Ireland, of which section he was President more than once. Though he did not often write for the journals, he was a frequent contributor to the Proceedings of the Academy, and attended its meetings with great regularity. In professional affairs generally he took an active part, and was a member of many committees, among others the Central Midwives Board. Personally he was a man of great charm, genial, sympathetic, and unassuming. Both in the profession and outside it he had innumerable friends. Of his surviving family one son is a member of the medical profession.

ALBERT HAWORTH, M.Sc., M.B., CH.B. MANCH.

IT is with sincere regret that we record the death of Dr. Albert Haworth, assistant lecturer in chemical pathology to the Manchester Royal Infirmary, at the age of 36. Last July, in the course of his duties, Dr. Haworth carried out a post-mortem examination in the Royal Infirmary, in doing which he received a cut on his finger from a projecting rib of the cadaver. An infection followed which subsequently seemed to disappear, but later grave symptoms manifested themselves and he was removed to the infirmary, where he died on Sept. 6th from pneumonia. Mr. C. W. W. Surridge, the Manchester City coroner, in returning a verdict of accidental death, said Dr. Haworth had died from an injury received whilst carrying out important public duties, and his death in these circumstances was very regrettable. Dr. Haworth was born at Harwood, near Blackburn. In 1912 he took the degree of M.Sc. at Manchester University, specialising in chemistry. Attracted to medicine, he graduated as M.B., Ch.B. in 1920, but his bent was rather towards the scientific side of medicine than its practical aspects, and more especially did chemical pathology appeal to him. He was for a time a demonstrator in the pathological department and later studied pathological chemistry at St. Thomas's Hospital, London. Quite recently he was appointed lecturer in chemical pathology at the University of Leeds and should have taken up his duties there next month. Dr. Haworth was married, and to his widow, who is also a member of the medical profession, we extend our heartfelt sympathy.

THOMAS SYDNEY SHORT, M.D. LOND., D.P.H. CAMB.

Dr. T. Sydney Short, of 85, Edmund-street, Birmingham, senior physician to the General Hospital, Birmingham, died recently at Claverdon, Warwick, while on holiday. Dr. Short was born in 1860 at Sheffield. He received his medical education at University College, London, and qualified as M.R.C.S. Eng. and L.S.A. in 1883. Two years later he took the degree of M.B., and in 1886 he gained the medal in hygiene at University College, obtaining the D.P.H. Cambridge in the same year.

In 1891 he became an M.D. Lond. and M.R.C.P. Lond. On first qualifying, Dr. Short held the post of house physician at King's College Hospital, and later that of assistant demonstrator in anatomy at the medical school. After a period as resident medical and surgical officer at Jaffray Suburban Hospital, Birmingham, he was appointed assistant honorary physician to the Birmingham General Hospital in 1891, and remained on the staff of that institution until his death. He was also consultant physician to the General Dispensary, Birmingham. Dr. Short contributed several articles to medical journals, dealing with such subjects as the treatment of epilepsy, the treatment of arthritis, and the dietetic treatment of gout and kindred conditions.

Medical News.

UNIVERSITY OF OXFORD.—Lieut.-Colonel Sir Charles H. Bedford, who recently received the honorary degree of Doctor of Civil Law (D.C.L.), was attached for 22 years to the Indian Medical Service. His work in India was carried out mainly as chemist to the Government, and he conducted a long series of successful scientific and technical researches on alcohol for the Customs and Excise Departments. On retiring from the Service in 1911 he received the honour of knighthood. Since then his expert knowledge on power and industrial alcohol development has been placed at the disposal of the Colonial Office, and he was the first general manager of the Association of British Chemical Manufacturers. Edinburgh and St. Andrews Universities have previously conferred upon him honorary degrees.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The Fellowship of Medicine and Post-Graduate Medical Association announce that an intensive course in general medicine and surgery and the various special departments will be given at the Westminster Hospital, S.W. 1, from Sept. 22nd to Oct. 3rd, from 10.30 A.M. to 5.30 P.M. each day. The first lecture will be given by Mr. Walter Spencer at 10.30 A.M. on Monday, Sept. 22nd, on Oral Sepsis. The names of those wishing to attend should be sent to the Secretary of the Fellowship of Medicine, 1, Wimpole-street, W. 1, if possible by Sept. 19th.

THE Central Association for Mental Welfare has arranged a course in mental diseases for secretaries of associations for mental welfare and for other experienced social workers, to be held from Monday, Oct. 27th, to Saturday, Nov. 1st, at the Maudsley Hospital, Denmark Hill, London, S.E., under the direction of Dr. Edward Mapother, medical superintendent of the hospital. The course will consist of lectures on mental diseases and mental deficiency, with clinical demonstrations at the Maudsley and County Mental Hospitals, and at certified institutions for defectives. Early application must be made to the Hon. Secretary, 24, Buckingham Palace-road, London, S.W. 1.

THE LATE DR. V. F. ALLEN.—Vernon Francis Allen, of Swaffham, Norfolk, whose death at the age of 58 occurred recently as the sequel to a motor accident in which he was injured some months ago, was surgeon to the Swaffham Cottage Hospital and a well-known local figure. He was the third son of Christopher Allen, J.P., of Stone Hall, Glandore, Co. Cork, and qualified L.R.C.S. & P. Edin. and L.R.F.P.S. Glasg. in 1891. A year or two later Dr. Allen began to practise in Swaffham, first as assistant, later as partner to Dr. R. B. Marriott, eventually in 1898 taking over the entire work. In 1898 he also became an urban district councillor, a position he held until 1910. In 1922 he was joined in his practice by Dr. W. B. Cathcart. Dr. Allen took a keen interest in breeding greyhounds and in coursing. He is survived by a widow and two children.

at once that the determining factor leading to bad results is to be sought in the patient, and the evidence at hand bears this out. Gastro-enteritis, especially of a hæmorrhagic type, is apparently a contra-indication for the use of carbon tetrachloride, as are cirrhosis of the liver, nephritis, or acute or chronic alcoholism. In other words, any conditions favouring absorption of the drug are contra-indications, as are existing lesions in such viscera as may be habitually injured to some slight extent by the small amount of the drug usually absorbed. A seriously damaged liver or kidney may not tolerate a slight additional injury.

As regards santonin for removing hook-worms, there are a number of reports of its use in human and veterinary medicine, showing that it is entirely ineffective. I have given to dogs large amounts of santonin in single dose and in doses repeated for long periods, and found it entirely ineffective against hook-worms.

With reference to whether carbon tetrachloride is a true anthelmintic, I am of the opinion, after ten years spent in the experimental investigation of anthelmintics, that it is. The word anthelmintic is a generic term, just as the word poison is a generic term, the anthelmintics being a heterogeneous group of poisons which poison parasitic worms. How they poison them is of little importance from the standpoint of medical practice and results, although it is a matter of great importance from a scientific standpoint. If we make academic distinctions in any field we cloud the field and waste time. The distinction between vermifuge and vermicide is another academic distinction of no real value whatever. One may say that a vermifuge drives out worms, alive or dead, and that a vermicide kills worms and may or may not have sufficient purgative action to remove them promptly. But if the worms are removed it is of no importance whatever whether they are alive or dead; a worm removed is for all practical purposes a worm dead, and whether the drug kills it or it dies as a result of removal from the only environment in which it can live is of no consequence. Whether an anthelmintic is also purgative or is not purgative is of interest only as the administration of a separate purgative is unnecessary or is necessary. The subject of anthelmintic investigation would proceed faster if we would drop these antiquated terms, adopted at a time when we knew almost nothing of anthelmintic action, and speak and write in terms of anthelmintic action as one thing, and of purgation as another. Anthelmintics may be actually purgative, as in the case of arecoline hydrobromide; mildly laxative, as is the rule in the case of carbon tetrachloride; or actually constipating, as in the case of chenopodium. Since purgation is desirable in the case of all anthelmintics, it follows that such drugs as arecoline hydrobromide should not be accompanied by a purgative, since purgation is assured in advance, that such drugs as carbon tetrachloride should be accompanied by a purgative to ensure purgations, and that such drugs as chenopodium should be accompanied by a purgative, additional purgatives or enemas being given a few hours later if prompt purgation does not follow the initial dose.

So far as any knowledge as to the specific action of anthelmintics on worms is concerned we know practically nothing, and this is a subject which merits extensive investigation. From a practical standpoint we are directing attention at present to finding anthelmintics which will be effective and safe. An ideal anthelmintic would be 100 per cent. effective and 100 per cent. safe. That we shall ever find such a poison, one injuriously affecting one kind of animal, the parasite, and in no wise injuriously affecting another kind of animal, the host, is unlikely. Whether a knowledge of the manner in which anthelmintics affect parasites would aid in any way in finding an approximately ideal anthelmintic is doubtful, but we should have the information for what it might be worth as well as for its purely scientific interest. At the present time the most promising line of attack in solving the problems of anthelmintic medication lies along the lines of correlation of anthelmintic efficacy with the chemical composition and physical properties of anthelmintics, and investigations along these lines are already beginning to point to some conclusions which promise to be of considerable value.

I am, Sir, yours faithfully,

MAURICE C. HALL,
Zoologist.

United States Bureau of Animal Industry,
August 26th, 1924.

UNIVERSAL ANÆSTHETIC APPARATUS.

To the Editor of THE LANCET.

SIR,—Dr. R. J. Clausen criticises the combined anæsthetic pump and suction apparatus on the ground that it is fitted with rubber tubing for its connexions. I agree that theoretically it would be better to have metal pipes fixed with nuts and unions, making the whole apparatus into one rigid unit, but practically there are many objections. In the first place, the detachability of the bottles and other parts for cleaning would be impaired. Secondly, a large number of soldered joints tend towards fracture when in hard use; many car manufacturers are now, in fact, substituting flexible pipes for rigid ones where practicable. Furthermore, if the whole system were absolutely gas-tight at any pressure an accident might arise if the blow-off device became inoperative. Lastly, expense is a serious matter—at any rate to the anæsthetist. The pressure-tubing used in the apparatus is made of composition which does not perish in several years of use and the joints are gas-tight up to 70 mm. Hg. The only serious objection to its use is that, if a dry gas is forced through it at very high pressure, it is possible for it to become electrically charged, and a small static spark may result. It is conceivable that a highly explosive mixture such as ethylene-oxygen might become ignited in this way, but I should imagine that the risk is too infinitesimal to be worth considering.

I am, Sir, yours faithfully,

C. LANGTON HEWER.

York-terrace, Regent's Park, N.W., Sept. 6th, 1924.

THE CLINICAL THERMOMETER AS A CARRIER OF INFECTION.

To the Editor of THE LANCET.

SIR,—There is no doubt about the risk, but as the thermometer is a necessary equipment for the diagnosis of disease why not minimise this risk by the use of a "family" thermometer? In a great number of patients' houses now we find clinical thermometers provided. The class of people who use them do not like the idea of having the doctor's thermometer put in their mouths after being used by strangers in all forms of disease. If every household had its own clinical thermometer it would prevent the spread of infection to others.

I am, Sir, yours faithfully,

Berkeley-street, W., Sept. 9th, 1924. HENRY DUTCH.

DONATIONS AND BEQUESTS.—The executors of the late Sir Samuel Turner, of Rochdale, one of the pioneers of the asbestos industry, announce that he has left, in addition to the endowment of other charities, £3000 to Rochdale Infirmary, £1000 each to the Rochdale District Nursing Association and the Crippled Children's Union, £500 to the Rochdale and District Society for the Blind, and £1000 to the National Children's Home and Orphanage.—Mr. Walter John Tillett, Penarth, shipowner, left £10,000 to the King Edward VII. Hospital, Cardiff (Cardiff Infirmary), upon trust to devote the income firstly towards the maintenance of the Elizabeth Tillett bed in memory of his wife, and subject thereto for the general purposes and upkeep of the hospital.—Miss Eliza Moore, of St. Annes-on-the-Sea, Lancs, among other bequests, bequeathed £1000 to the Beckett Hospital and Dispensary, Barnsley, Yorks, to endow four beds to be known as the William Moore, Elizabeth Moore, Eliza Moore, and May Elizabeth Moore beds; £1000 to Dr. Barnardo's Homes, £2000 to Dr. Stephenson's Wesleyan Orphan Homes, £2000 to the National Society for the Prevention of Cruelty to Children, £2000 to the National Institution for the Deaf and Blind, and £2000 to the National Institution for the Dumb. Altogether Miss Moore left over £25,000 to various charities.—Mr. Albert Henry Bruton left £500 to the Gloucester Royal Infirmary.

Nottingham General Dispensary.—Res. S. £250.
Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.
Plymouth, South Devon and East Cornwall Hospital.—H.S. and H.P. £100 and £50 respectively.
Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P., Each £150. Also Jun. H.S. and H.P. Each £110.
Queen's Hospital for Children, Hackney-road, E.—H.S. £100.
Royal Ear Hospital, Dean-street, Soho.—Reg. £50.
Royal Free Hospital, Gray's Inn-road, W.C.—Med. Reg.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S.'s. Each £150.
Royal Naval Medical Service.—Surg. Lieuts. 25s. per day.
St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Hon. P.
St. Marylebone Hospital, Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.
Seamen's Hospital Society, Greenwich.—H.S. for Albert Dock Hospital. Also H.P. and H.S. at Dreadnought Hospital. Each £150.
Shanghai Municipal Council, Public Health Department.—Asst. Path. £1250.
Sheffield Royal Infirmary.—Res. Surg. O. £200.
South London Hospital for Women, Clapham Common, S.W.—H.P. and three H.S.'s. Each £50.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each £100.
Winchester, Royal Hampshire County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W. announces a vacant appointment at Kirkwall, Orkney.

Births, Marriages, and Deaths.

BIRTHS.

Barry.—On August 31st, at The Chestnuts, Roos, E. Yorks. the wife of J. H. Barry, L.R.C.P. & S. Irel., of a son.

Bastian.—On Sept. 5th, at St. David's-road, Southsea, the wife of Surgeon-Commander W. Bastian, R.N., H.M.S. *Dryad*, of a daughter.

Hadfield.—On August 31st, at "The Red House," Beaconsfield, the wife of J. A. Hadfield, M.B., Ch.B. Edin., of a son.

Marks.—On Sept. 3rd, at Inverness-terrace, Hyde Park, the wife of Maurice J. Marks, L.D.S. R.F.P.S. Glasg., of a son.

McElligott.—On Sept. 6th, at 177, Westmount-road, Eltham, S.E.9, to Dr. Geraldine, wife of Dr. E. T. McElligott—a son.

Reichwald.—On Sept. 1st, at Timber Hill, Ashtead, Surrey, the wife of Dr. M. B. Reichwald, M.B., B.S. Lond., of a daughter.

Stocker.—On Sept. 2nd, at Glebe Croft, Bakewell, the wife of Major C. J. Stocker, M.D. Camb., I.M.S., of a son.

MARRIAGES.

Wilson—Curjel.—At Christ Church, Simla, on the 16th August, 1924, by the Revd. C. H. Hemming, William Robert Wilson, Indian Civil Service, to Dagmar F. Curjel, M.D. Glasg., D.P.H. Camb., Assistant to the Inspector-General of Civil Hospitals, Punjab.

Wood—Wolseley.—On Sept. 6th, at St. Stephen's, Twickenham, Edward Archer Wood, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Dulwich, to Minnie Bathurst Wolseley, daughter of Henry John Wolseley, M.B., C.M. Edin., and Mrs. Wolseley, also of Dulwich.

DEATHS.

Allen.—On August 30th, at Swaffham, Norfolk, Vernon Francis Allen, L.R.C.P. & S. Edin., aged 58.

Armstrong.—On August 31st, at Victoria-road, Old Charlton, Lieut.-Col. John Armstrong, L.R.C.P. & S. Irel., R.A.M.C. (retired).

Douglas.—On August 15th, at Adelaide, South Australia, Archibald Home Douglas, M.D., formerly residing in Edinburgh.

Evans.—On August 31st, at Rosslyn-hill, Hampstead, N.W., suddenly, William Norman Evans, M.R.C.S. Eng., L.R.C.P. Lond.

Griffin.—On August 21st, Montagu Laurence Griffin, M.B., B.Ch., B.A.O. Dub., of Plymouth, aged 64.

Gulland.—On Sept. 4th, at Malvern Hill House, Cheltenham, Alexander Dudgeon Gulland, Surgeon-General, M.D. Edin., in his 91st year.

Horne.—On Sept. 5th, at Merrion-square, Dublin, Sir Andrew John Horne, F.R.C.P. Irel., aged 68.

Murray.—On Sept. 2nd, at Aberdeen, John Murray, M.B. C.M. Aberd., Lieutenant-Colonel, A.M.D., of Mastrick and Ashburn-gardens, S.W., in his 82nd year.

Needham.—On Sept. 6th, at Bournemouth, Frederick Needham, M.D. St. And., M.R.C.P. Edin., M.R.C.S. Eng., L.S.A., late Commissioner of the Board of Control, aged 88.

Paterson.—On Sept. 2nd, very suddenly, at Buncrana, Co. Donegal, Ireland, William Bromfield Paterson, F.R.C.S. Eng., L.D.S., of Manchester-square, London, W., aged 63.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

LABORATORY FACILITIES UNDER THE NATIONAL HEALTH INSURANCE.

By T. Lister Croft, LL.B.,

SECRETARY, MEDICAL AND PANEL COMMITTEE, WEST RIDING OF YORKSHIRE.

At the recent British Medical Association Conference held in Bradford the Medical Sociology Section discussed the question, "Has the National Insurance Act justified its existence?" One of the speakers, Dr. G. B. Hillman, of Wakefield, dealing with the question from the general practitioner's point of view, referred to the West Riding Scheme for Laboratory Facilities as an instance of progressive action on the part of panel committees. This statement has created some inquiry as to the scope and character of this scheme, and the following particulars may be of interest. It would be more correct to refer to these facilities as an arrangement with the Public Health Department of the West Riding County Council rather than as a fully matured scheme.

The question of laboratory facilities was first raised by the West Riding Panel Committee in 1919. The County Council were at the time rendering quite voluntary assistance to the general practitioners in the area by the examination of specimens, but no definite arrangement was in force. It was felt by the Panel Committee that something more was required. The question was discussed and considered, and ultimately the following resolution was passed:—

"That in the opinion of this Committee the time has arrived when laboratory facilities should be provided in the West Riding for the more scientific investigation of disease than is possible with the facilities at present available."

A copy of this resolution was sent to the West Riding Insurance Committee and also to the Ministry of Health, and the resolution was subsequently approved by the West Riding Insurance Committee, who intimated such approval to the West Riding County Council and the Ministry of Health.

A subcommittee continued to work on the matter for some time, and ultimately presented the following suggested scheme which was approved and adopted by the Panel Committee.

Suggested Scheme.

1. That every insured person should have access through his or her doctor to every kind of laboratory examination and vaccine treatment which the doctor considers he or she needs for the proper treatment of any illness.
2. That every panel doctor should have access to the laboratory and the right of consultation with the bacteriologist on any specific matter referred by the former to the latter.
3. That laboratory facilities should be given as an "additional benefit."
4. That the most satisfactory arrangement would be the provision and maintenance of a laboratory equipped with staff and all needful requirements, but—failing this—that an arrangement should be made with some one or more laboratories at present existing for the work to be done at a definite scale of fees.
5. That in the event of a separate laboratory being created—(*a*) small stocks of outfits (for urgent cases) should be distributed amongst representative doctors (such as members of the local medical committee) for supply to doctors on application; (*b*) that the advice and aid of the bacteriologist should, as far as possible, be available to doctors for demonstrating methods difficult in technique (such as lumbar punctures, &c.).
6. That if existing laboratories are utilised some such arrangement as in 5 (*a*) be made with the contracting laboratory.

Staff Required.—One well-qualified and specialised bacteriologist; one unqualified laboratory assistant; one (part-time) cleaner or caretaker. Approximate initial cost, £1100. Approximate annual cost, £2500 to £3000.

This scheme has never operated, as it was unfortunately brought forward at a time when it could not possibly be financed. It is interesting to note that so far as the West Riding, with its population of 500,000 is concerned, the cost would not run to more than 1½*d*. per insured person per annum.

Eventually, as a result of the Panel Committee's resolution and other circumstances which arose, a conference was arranged between the Panel Committee and the West Riding Public Health Committee. At this conference the Panel Committee stated that its reason for bringing forward the question and formulating the scheme arose from the urgent necessity for suitable laboratory facilities being provided for obtaining adequate scientific treatment in all cases. They pointed out that the health of the individual resulted in the general health and well-being of the community. The county authorities stated that they had every desire to help the general practitioner, and expressed themselves as willing and anxious to meet the position by

A SERIES of eight lectures will be given this autumn by members of the lecturing staff of the People's League of Health on the Mind and What We Ought to Know About It. These will be delivered at the Medical Society's headquarters, 11, Chandos-street. Cavendish-square. W. 1. beginning on Monday, Oct. 20th. at 6 P.M., and continuing on subsequent Monday evenings till Dec. 8th. The lectures will be delivered by Dr. Bernard Hart, Dr. Thomas Beaton. Dr. R. G. Rows, Sir Maurice Craig. Sir Robert Armstrong-Jones, Sir Frederick Mott, Dr. W. A. Potts, Dr. A. F. Tredgold. A syllabus of the course will be sent on application to the hon. organiser, 12, Stratford-place, London, W. 1.

ROYAL INFANT ORPHANAGE, WANSTEAD.—The next half-yearly election for the *admission of fatherless* children to the orphanage at Wanstead, E. 11, will be held in November. Children under 7 years of age are eligible, and applications for information and nomination papers should be addressed to the secretary at the orphanage.

MEMORIAL TO THE LATE MR. NEWBOLT.—A brass tablet to the memory of the late Mr. G. P. Newbolt, surgeon of Liverpool, was unveiled by the Lord Mayor of Liverpool on Sept. 4th at Leasowe Hospital for Crippled Children. The wording on the memorial tablet reads: "In gratitude to God for the memory of George Palmerston Newbolt. C.B.E.. F.R.C.S., First Chairman of the Medical Board of this Hospital. A great surgeon, a lover of children, a faithful servant of his fellow men. 'His name a great example stands.'"

THE LATE DR. T. MCCRAITH FOLEY.—Thomas McCraith Foley, L.R.C.P. & S. Irel., who died recently at Scarborough. was medical officer to the Union Infirmary of that town. He was a son of the late Rev. Patrick Foley, of Kilscoran. Co. Wexford. Ireland, and qualified in medicine in 1887. After some experience as a ship's surgeon, including service on the Sultan of Morocco's yacht. he started practice in Scarborough about 30 years ago, and took an active interest in municipal affairs. He was a member of the Scarborough town council and acted for a time as chairman of the health subcommittee of the council. He was connected with the 5th Yorkshire Regiment (Territorials) for many years and retired with the rank of surgeon-colonel. During the war, from 1914 to 1917. he was attached to the R.A.M.C. Dr. Foley is survived by his widow.

THE LATE DR. W. NORMAN EVANS.—William Norman Evans, M.R.C.S., L.R.C.P.Lond., who died recently as the result of a sudden heart attack, at his residence at 43, Rosslyn-hill. Hampstead, in his sixtieth year, was a member of a family which has been associated with Hampstead for 150 years. He was the sixth in uninterrupted succession to practise medicine in the borough. His father was Herbert Norman Evans, M.B. Oxf., of Hampstead House, Seaford, Sussex, to whose practice in Thurlow-road he succeeded about 30 years ago. He received his medical education at St. Bartholomew's Hospital, qualifying in 1887. He was for some years Surgeon-Captain of the 19th Middlesex R.V., commanded the 5th London Volunteer Infantry Brigade Bearer Company, and was formerly the medical officer of the Cripples' and Incurables' Home for Children at Hampstead. At the time of his death he was senior medical officer of the Hampstead Provident Dispensary. He had been in partnership with Dr. W. E. Hills, of Church Row, since 1903. Dr. Evans leaves a widow and two daughters.

MEMORIAL TO THE LATE SIR WILLIAM MACEWEN.—At a meeting held in the Hall of the Royal Faculty of Physicians and Surgeons, Glasgow, on May 22nd and reported in THE LANCET (May 31st, 1924, p. 1133), it was resolved to promote a fitting memorial to the life and work of the late Sir William Macewen. The meeting was a full and enthusiastic one, and a strong general committee was formed, as well as an executive representative of the different interests, both committees being given power to add to their number. It was decided, as the result of several meetings which have been held since, that the fund to be collected shall be applied to three main purposes, in the following order: (1) The provision of a bronze bust of Sir William Macewen, by Mr. G. H. Paulin, to be placed in the University, and a replica for Lady Macewen; (2) the establishment of a memorial lecture to be known as "The Sir William Macewen Lecture," to be delivered annually or biennially, dealing with any branch or aspect of surgical science; (3) the foundation of a Macewen medal or prize in surgery, to be awarded annually. It has not been decided yet whether this shall be assigned to the class of surgery at Glasgow University or shall be given a wider application. It is proposed to aim at the collection of a fund amounting to £3000, towards which a number of subscriptions, varying from £1 1s. to £100, have already been received. Intending subscribers should communicate with the hon. treasurer, Mr. James Macfarlane. D.L., LL.D., Wesleyan-st., Glasgow, S.E.

Messrs. Ernest Benn announce the forthcoming publication of "The Chemistry of the Blood in Clinical Medicine," by Dr. C. L. V. De Wesselow, chemical pathologist to St. Thomas's Hospital; and "Practical Surgery Illustrated," by Victor Pauchet, translated by F. R. H. Atkinson, M.D., with a special introduction by Sir Charles Gordon Watson, F.R.C.S.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC.—A post-graduate course will be held from Oct. 6th to Nov. 28th, consisting of the following subjects: out-patient clinics, clinical lectures and demonstrations; lectures on the anatomy and physiology of the nervous system; lectures on the pathology of the nervous system; clinical demonstrations *on* methods of examination. Copies of the syllabus may be obtained from Dr. J. G. Greenfield. Dean of the Medical School, at the Hospital, Queen-square, Bloomsbury, London. W.C. 1.

DANGEROUS DRUGS ORDER.—The wording of the conditions attached to the Order made on August 15th, 1921, under the Dangerous Drugs Act. 1920, *for the* exemption of certain hospitals and other institutions from the Dangerous Drugs Regulations. was found in certain respects to impose restrictions on medicine which did not themselves come within the scope of these Regulations. In order to make it clear that such substances *are not* to be regarded as subject to the conditions attached to the Order, the Home Secretary has now added to both Schedule I. and Schedule II. a new condition, which runs: "Nothing in this Schedule shall affect any medicine or other substance to which the Regulations do not apply." The alteration has been effected by the issue of a new Order (H.M. Stationery Office, 1*d.*), entitled the "Dangerous Drugs (Hospital General Exemption) Order (1924)," which replaces the Order of August 15th, 1921. Apart from the change of wording needed to correct the misunderstanding, this Order differs only in verbal points from the former Order.

Appointments.

BENTHAM, ETHEL, M.D. Brux., has been nominated by the Minister of Health to be a Member of the Metropolitan Asylums Board.

DORMER, P. A., M.D. Dub., B.A.O., D.P.H., has been appointed Medical Officer of Health for Jarrow.

DUNLOP, A. G., Certifying Surgeon under the Factory and Workshop Acts for the Worksop District of the County of Nottingham.

NEGUS, V. E., M.S. Lond., F.R.C.S. Eng., Junior Surgeon for Diseases of the Throat and Nose at King's College Hospital.

SINCLAIR, JAMES DONALD, M.R.C.S. Eng., L.R.C.P. Lond., to be one of the Medical Referees under the Workmen's Compensation Act, 1906, for the districts of the Barnard Castle, Darlington, Richmond County Courts (Circuit No. 2), and the Leyburn and Northallerton County Courts (Circuit No. 15).

STANTON, W. E., L.M.S.S.A. Lond., Certifying Surgeon under the Factory and Workshop Acts for the Market Deeping District of the County of Lincoln.

WOOD, DOROTHY, M.R.C.S. Eng., L.R.C.P. Lond., House Surgeon to the New Sussex Hospital for Women and Children, Brighton.

The Devon Royal Mental Hospital, Exminster: SOLLY, R. V., M.D., B.S. Lond., M.R.C.P. Lond., F.R.C.S. Eng., Consulting Pathologist: MUIR, D. MILLER, M.R.C.S. Eng., L.R.C.P. Lond., D.M.R. & E., Consulting Radiologist: LOCK, NORMAN F., F.R.C.S. Eng., M.B., Ch.B., L.R.C.P. Lond., Consulting Surgeon: ACKLAND, J. M., M.R.C.S. Eng., L.D.S., Consulting Dental Surgeon: HAWKES, G. P. D., M.D., B.C. Camb., Consulting Ophthalmic Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital and Dispensary.—H.P. £120.

Barnsley County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £600.

Birkenhead County Borough.—Asst. M.O. £150, res.

Bradford Royal Infirmary.—Two H.S.'s and one H.P. Each £150.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—H.S. £100. Also Jun. H.S. £50.

Evelina Hospital for Children, Southwark, S.E.—H.P. £120.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50.

Hull, Victoria Hospital for Sick Children.—H.P. £100.

Leeds City.—Asst. Clin. Tuberculosis O. £600.

Liverpool University.—Prof. of Anatomy. £800.

London Lock Hospital, 91, Dean-street, W.—H.S. £200.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each £50.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Hon. M.O. for Skin Dept.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—M.O. for Out-patients. £125. Phys to Out-patients.

Northampton General Hospital.—Hon. P.

Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.

Nottingham General Dispensary.—Res. S. £250.
Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.
Plymouth, South Devon and East Cornwall Hospital.—H.S. and H.P. £100 and £50 respectively.
Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P., Each £150. Also Jun. H.S. and H.P. Each £110.
Queen's Hospital for Children, Hackney-road, E.—H.S. £100.
Royal Ear Hospital, Dean-street, Soho.—Reg. £50.
Royal Free Hospital, Gray's Inn-road, W.C.—Med. Reg.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Two H.S's. Each £150.
Royal Naval Medical Service.—Surg. Lieuts. 25*s.* per day.
St. Marylebone General Dispensary, 30, Marylebone-lane, W.—Hon. P.
St. Marylebone Hospital, Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Peter's Hospital for Stone, Henrietta-street, Covent Garden, W.C.—H.S. £75.
Seamen's Hospital Society, Greenwich.—H.S. for Albert Dock Hospital. Also H.P. and H.S. at Dreadnought Hospital. Each £150.
Shanghai Municipal Council, Public Health Department.—Asst. Path. £1250.
Sheffield Royal Infirmary.—Res. Surg. O. £200.
South London Hospital for Women, Clapham Common, S.W.—H.P. and three H.S.'s. Each £50.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each £100.
Winchester, Royal Hampshire County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W. announces a vacant appointment at Kirkwall, Orkney.

Births, Marriages, and Deaths.

BIRTHS.

BARRY.—On August 31st, at The Chestnuts, Roos, E. Yorks. the wife of J. H. Barry, L.R.C.P. & S. Irel., of a son.

BASTIAN.—On Sept. 5th, at St. David's-road, Southsea, the wife of Surgeon-Commander W. Bastian, R.N., H.M.S. *Dryad*, of a daughter.

HADFIELD.—On August 31st, at "The Red House," Beaconsfield, the wife of J. A. Hadfield, M.B., Ch.B. Edin., of a son.

MARKS.—On Sept. 3rd, at Inverness-terrace, Hyde Park, the wife of Maurice J. Marks, L.D.S. R.F.P.S. Glasg., of a son.

MCELLIGOTT.—On Sept. 6th, at 177, Westmount-road, Eltham, S.E.9, to Dr. Geraldine, wife of Dr. E. T. McElligott—a son.

REICHWALD.—On Sept. 1st, at Timber Hill, Ashtead, Surrey, the wife of Dr. M. B. Reichwald, M.B., B.S. Lond., of a daughter.

STOCKER.—On Sept. 2nd, at Glebe Croft, Bakewell, the wife of Major C. J. Stocker, M.D. Camb., I.M.S., of a son.

MARRIAGES.

WILSON—CURJEL.—At Christ Church, Simla, on the 16th August, 1924, by the Revd. C. H. Hemming, William Robert Wilson, Indian Civil Service, to Dagmar F. Curjel, M.D. Glasg., D.P.H. Camb., Assistant to the Inspector-General of Civil Hospitals, Punjab.

WOOD—WOLSELEY.—On Sept. 6th, at St. Stephen's, Twickenham, Edward Archer Wood, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., Dulwich, to Minnie Bathurst Wolseley, daughter of Henry John Wolseley, M.B., C.M. Edin., and Mrs. Wolseley, also of Dulwich.

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The Panel Committee emphasised its desire that ultimately an additional medical benefit should be established and financed in the form of "laboratory benefit" for all insured persons. In the meantime, on behalf of the general practitioners, the Panel Committee gratefully accepted the proposed extended use of the County Laboratory and expressed the hope that if and when laboratory benefits were established the working of any scheme in connexion therewith might be linked up with the County Laboratory.

The arrangements thus come to with the county authorities have been working since 1922 with most excellent and beneficial results. Under these arrangements panel practitioners in the West Riding are able to obtain the infinite variety of bacteriological investigations—including the preparation of vaccines—which the modern practice of medicine renders so essential for the efficient treatment of their patients.

The West Riding Panel Committee are, however, still pushing forward their views. They have brought their proposed scheme to the notice of the Ministry of Health and one of the largest approved societies, and it is their intention to see that the need for full laboratory facilities for every insured person throughout the country is brought to the notice of the coming Royal Commission.

In the meantime, the annual conference of Panel Committees, held in October, 1923, have approved the following resolution brought forward by the West Riding Panel Committee :—

> "That it is essential for the satisfactory treatment of diseases occurring amongst insured persons that a full and complete laboratory service should be established in every area, and that the Insurance Acts Committee should be requested to take all necessary steps to ensure that such a service should be established at the earliest possible moment."

The annual conference of 1922 had already given support to some such scheme on the motion of a leading representative of a Yorkshire insurance committee.

SOME FURTHER SINS OF CIVILISATION.

To show that the vis medicatrix naturæ is coming to the front in practice and treatment of disease, we have only to instance the vogue of heliotherapy and of the return to more natural conditions as regards diet. There are, however, many other practices of daily life in which we have strayed from the early and presumably saner customs of the race, and Dr. C. W. Laver, of Western Australia, writes to us on the disadvantages to health entailed in our present mode of performing the act of defæcation. He states his conviction that the cardinal and sole factor in the causation of appendicitis is our artificial and unnatural posture in defæcation and in contradistinction to the squatting position for the following reasons. First, the box seat posture defeats correct direction of expulsion of excrement; secondly, it defeats gravitation ; thirdly, it defeats the free power of the expelling muscles ; and, fourthly, it defeats the support of the thighs to the abdominal walls and protection of the appendix. He also holds that constipation, the most common perhaps of our modern ills, is due to using the unnatural artificial method which causes abdominal strain. These reasons find their application in the causation of appendicitis through the forcing of fæcal matter from the intestinal canal into the appendix, and, further, the absence of protection of the thighs on the inguinal canal he considers an important causal factor in inguinal hernia.

CANAL CHILDREN.

CANAL boat children have for some time past been objects of solicitude in regard to their health and education. During the year April 1st, 1923, to March 31st, 1924, the chief inspector of the National Society for the Prevention of Cruelty to Children found[1] 225 children on canal boats, of whom 76 had been born there. Out of this number 158 were still under school age, and only 23 children—eight of them under 12 years of age—were seen at work on the boats. This great improvement on previous years is ascribed by the chief inspector to the work of the Society. It should, of course, be remembered that a departmental committee appointed by Dr. Addison in 1920 decided to prohibit children of school age from living on the boats during term time; this committee thought that in the long run the women, too, would leave the boats. The recent strike afforded the chief inspector opportunity of conversation with boatmen, when he found that the majority were in favour of leaving both women and children off the boats and working them by men only. While the average figures show no overcrowding on the standard of the Canal Boat Act, the chief inspector says that overcrowding does exist on a number of boats. Most of the one-cabin boats are registered for three adults, or two adults and two children under 12 years; in two-cabin boats registered for two adults and five children, the tendency is for the whole family to occupy one cabin only. Six fatal accidents to children occurred during the year, five by drowning and one by scalding; one girl of 7 years has fallen into the canal three times, and a boy of 11, already rescued 16 times, was nearly drowned last year. From the point of view of education, the exclusion of children from the canal boats, which is fast becoming an accomplished fact, is to be welcomed. As far as health is concerned they compare favourably with town children, the freedom of the daytime compensating for the narrow, unventilated cabins at night; the incidence of infectious disease has been slight. But it is evident that as time goes on there will remain little canal boat inspection for the Society to do.

UNSIGHTLY WARTS.

To the Editor of THE LANCET.

SIR,—Referring to Dr. G. S. Sander's request for advice as to the treatment of small, multiple soft warts on the back of the hand (THE LANCET, August 2nd, p. 256), I beg to say that I have successfully treated many such cases with liquor ferri perchloridi fort, B.P., as an escharotic, by carefully applying it with a small, blunt-pointed glass rod, avoiding the skin around the bases of the warts.—I am, Sir, yours faithfully,

Jamaica, August 22nd. A. J. SALMON, M.D., C.M. Camb.

A DAY-BOOK AND LEDGER COMBINED.

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Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE
MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, Sept. 15th, to SATURDAY, Sept. 20th.—ROYAL
WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross.
Clinical Instruction every afternoon from 2 P.M.
Wed., 5 P.M., Mr. Gimblett: Clinical Demonstration
on Common Affections of the Eye. Thurs., 5 P.M.,
Mr. Morgan: Fundus Class. Fri., 10 A.M., Mr. Hine:
Methods of Examination.—INFANTS HOSPITAL, Vincent-
square, Westminster. Mon., 2 P.M., Dr. W. E. Robinson:
O.P., Cases of Malnutrition. 3 P.M., Dr. Nora Schuster:
Demonstration, Chemical Examination of the Blood.
4 P.M., Mr. Tyrrell Gray: Lecture, Pyloric Stenosis.
Tues., 2 P.M., Dr. Eric Pritchard: O.P., Feeding Cases.
3 P.M., Dr. Caroline Maule: Demonstration, the
Schick Test, &c. 4 P.M., Mr. Philip Franklin: Chronic
Nasal Discharge and Sinusitis in Children. Wed.,
2 P.M., Dr. Helen Mackay: O.P., Cases of Birth Injury.
3 P.M., Dr. Eric Pritchard: Demonstration, the
Modification of Cow's Milk. 4 P.M., Dr. Donald Paterson:
Lecture, Infections of the Urinary Tract. Thurs.,
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ments.

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[1] Annual Report, 1923-24. Victory House, Leicester-sq., W.C.

The Montgomery Lecture

ON THE

EVOLUTION OF THE PUPILLARY REACTIONS.

Delivered at the Royal College of Surgeons in Ireland

BY E. TREACHER COLLINS, F.R.C.S. ENG.,
CONSULTING SURGEON, ROYAL LONDON OPHTHALMIC HOSPITAL, AND OXFORD EYE HOSPITAL.

REGARDING knowledge of the biological evolution of a vital phenomenon as essential for the study of its manifestation in man, I have collected observations from various sources regarding the pupillary reactions in animals, in the endeavour to investigate the upgrowth of their mechanism.

In 1890, being desirous of examining the arrangement of the pigment epithelial cells in the uveal tract, I introduced a method of depigmenting microscopical sections of the eye by means of chlorine water and a weak solution of hydrochloric acid, which I described in the Royal London Ophthalmic Hospital Reports for December of that year. Since that time several improved methods of bleaching sections have been adopted. That most usually employed now is Alfieri's method with permanganate of potash and oxalic acid. By such depigmentation several new anatomical points in connexion with the histology of the iris and ciliary body have been discovered. By it Henry Juler and John Griffiths[1] were able to demonstrate, in 1894, the presence of dilator contractile fibres in the nucleated layer at the back of the iris, immediately in front of the posterior layer of pigmented cubical epithelial cells.

DEVELOPMENT OF MUSCLE FIBRES OF THE IRIS.

It was by bleaching sections that Grynfeltt[2] in 1899, Heerfordt[3] in 1900, and Forsmark[4] in 1905, proved that Bruch's membrane in the iris is formed of fibres derived from cells in the outer layer of the secondary optic vesicle.

It was shown that these cells are at first cylindrical or cuboid, and contain nuclei at or near their centres, and that later the anterior part of each cell is differentiated by the outgrowth of a contractile fibre, while the nucleus and the pigment are displaced towards the posterior end. The fibres blend to form the dilator muscle of the iris, which is, therefore, an epithelial structure.

The researches of Nussbaum[5] in 1899, and of Szili[6] in 1901, showed that the sphincter muscle of the iris, like the dilator, originates from the anterior layer of the pigment epithelium on its posterior surface, starting at the point where it folds backwards to become the posterior layer.

The sphincter appears first as a group of nuclei which soon extends in the direction towards the ciliary border of the iris, its cells assuming the spindle-shape and remaining for a time closely connected with the anterior epithelium. About the fifth month, in the human fœtus, connective tissue from the iris stroma begins to insert itself between the sphincter and the epithelium, from the outer side, and a month later the muscle is divided by septa of connective tissue into two or three parts. At birth the sphincter still lies to a large extent upon the epithelium and remains united with it at the pupil margin. Sphincter and dilator therefore are both epithelial structures springing from the same layer of cells. They are connected with each other by numerous fibres of the same nature as themselves.

More recently, in 1922, Holth and Berner,[7] by bleaching sections of the iris, have proved that cases of congenital miosis are due to aplasia of the dilator muscle of the pupil.

A study of the morphology of the ciliary muscle in mammals shows that it is composed of spindle-shaped unstriated fibres, lying in spaces corresponding to those of the lamina supra-choroidea in the hinder part of the globe and to those of the ligamentum pectinatum anteriorly. The cells lining these lymphatic spaces are endothelial cells, and the ciliary muscle is formed by the proliferation and lengthening out of such endothelial cells into spindle-shaped cells. In the eyes of animals, and in pathological specimens of human eyes, cells are met with in the vicinity of the ciliary muscle fibres presenting transitional stages between endothelial cells and muscle cells. Cases have been recorded by Salzman and Fuchs in which muscle fibres have been met with in the lamina supra-choroidea, even as far back as the neighbourhood of the optic papilla. Evidently, therefore, the fibres of the ciliary muscle, unlike those of the iritic muscles, are mesoblastic in origin.

At first it seems strange that muscle fibres should be developed from cells of the neural epiblast, and that in two adjoining parts of the uveal tract—the iris and the ciliary body—which in the human eye are so frequently associated in their action, they should have been derived from different layers of the blastoderm. Here again I think a consideration of the morphology of the parts enables us to understand how this has come about.

DIRECT RESPONSE OF IRIS MUSCLE TO LIGHT IN SOME COLD-BLOODED VERTEBRATES.

It has been found that in amphibians and fishes light causes contraction of the pupil in the excised eye. The iris of an eel when cut out and placed in normal saline solution, contracts to the stimulus of light, which contraction seems to be due to direct action of light on its muscular fibres. The pigmented cells which compose the outer layer of the secondary vesicle, where it lies in contact with the retina, when stimulated by light manifest amœboid movements. They send out processes which protrude inwards between the outer segments of the rods and cones. Such movements are accompanied by currents in the fluid cell protoplasm, and migration of the long pigment particles into the processes from the body of the cell; they are very pronounced in fish and frogs and other cold-blooded animals.

Protoplasmic movement, the result of photic stimuli, is common in plants but comparatively rare in animals. It is met with in some of the lowest forms of animal life, in some fresh-water amœbæ, some hydra, and some of the ciliated infusoria. In the tissues of higher animals such movements have been retained only in the cells of the visual organs. It has been found that phototaxis in lowly developed organisms is chiefly, if not solely, brought about by rays of short wave-length, the blue, violet, and ultra-violet; which suggests that the real stimulus is chemical, not thermal in character, and similar to that produced by the action of light through chlorophyll in plants. That some chemical action is produced in the pigmented cells of the retina, by the action of light on them, is shown by their alkaline reaction being turned into an acid one, due probably to an oxidising process, the pigment granules in the cells, by the absorption of light, assisting in such changes of light-energy into protoplasmic movement.

In a fish's eye, like that of an eel, which has no ciliary body, the outer layer of cells developed from the secondary optic vesicle, where it ceases to line the retina, is continued directly on to the back of the iris. As those cells which line the retina have phototactic powers it is not surprising to find similar powers present in those which line the iris. Those which line the retina receive the stimulus of light on their inner surface, and protrude processes from it into the potential spaces between the rods and cones. Those lining the back of the iris receive the light stimulus on their outer surface which have processes proceeding from it, constituting the so-called membrane of Bruch, or dilator muscle of the iris. These cells of the outer layer of the secondary optic vesicle at the back of the iris lie flattened out against the stroma. Their processes do not project into it but run radially, so that when they become retracted in the dark the pupil dilates. The sphincter muscle is composed of spindle-shaped cells, which have budded off from the point of junction of the two layers of the secondary optic doing all laboratory work as far as they possibly could and not limiting the work to so-called public health work.

The Panel Committee emphasised its desire that ultimately an additional medical benefit should be established and financed in the form of "laboratory benefit" for all insured persons. In the meantime, on behalf of the general practitioners, the Panel Committee gratefully accepted the proposed extended use of the County Laboratory and expressed the hope that if and when laboratory benefits were established the working of any scheme in connexion therewith might be linked up with the County Laboratory.

The arrangements thus come to with the county authorities have been working since 1922 with most excellent and beneficial results. Under these arrangements panel practitioners in the West Riding are able to obtain the infinite variety of bacteriological investigations—including the preparation of vaccines—which the modern practice of medicine renders so essential for the efficient treatment of their patients.

The West Riding Panel Committee are, however, still pushing forward their views. They have brought their proposed scheme to the notice of the Ministry of Health and one of the largest approved societies, and it is their intention to see that the need for full laboratory facilities for every insured person throughout the country is brought to the notice of the coming Royal Commission.

In the meantime, the annual conference of Panel Committees, held in October, 1923, have approved the following resolution brought forward by the West Riding Panel Committee:—

"That it is essential for the satisfactory treatment of diseases occurring amongst insured persons that a full and complete laboratory service should be established in every area, and that the Insurance Acts Committee should be requested to take all necessary steps to ensure that such a service should be established at the earliest possible moment."

The annual conference of 1922 had already given support to some such scheme on the motion of a leading representative of a Yorkshire insurance committee.

SOME FURTHER SINS OF CIVILISATION.

To show that the vis medicatrix naturæ is coming to the front in practice and treatment of disease, we have only to instance the vogue of heliotherapy and of the return to more natural conditions as regards diet. There are, however, many other practices of daily life in which we have strayed from the early and presumably saner customs of the race, and Dr. C. W. Laver, of Western Australia, writes to us on the disadvantages to health entailed in our present mode of performing the act of defæcation. He states his conviction that the cardinal and sole factor in the causation of appendicitis is our artificial and unnatural posture in defæcation and in contradistinction to the squatting position for the following reasons. First, the box seat posture defeats correct direction of expulsion of excrement; secondly, it defeats gravitation; thirdly, it defeats the free power of the expelling muscles; and, fourthly, it defeats the support of the thighs to the abdominal walls and protection of the appendix. He also holds that constipation, the most common perhaps of our modern ills, is due to using the unnatural artificial method which causes abdominal strain. These reasons find their application in the causation of appendicitis through the forcing of fæcal matter from the intestinal canal into the appendix, and, further, the absence of protection of the thighs on the inguinal canal he considers an important causal factor in inguinal hernia.

CANAL CHILDREN.

CANAL boat children have for some time past been objects of solicitude in regard to their health and education. During the year April 1st, 1923, to March 31st, 1924, the chief inspector of the National Society for the Prevention of Cruelty to Children found[1] 225 children on canal boats, of whom 76 had been born there. Out of this number 158 were still under school age, and only 23 children—eight of them under 12 years of age—were seen at work on the boats. This great improvement on previous years is ascribed by the chief inspector to the work of the Society. It should, of course, be remembered that a departmental committee appointed by Dr. Addison in 1920 decided to prohibit children of school age from living on the boats during term time; this committee thought that in the long run the women, too, would leave the boats. The recent strike afforded the chief inspector opportunity of conversation with boatmen, when he found that the majority were in favour of leaving both women and children off the boats and working them by men only. While the average figures show no overcrowding on the standard of the Canal Boat Act, the chief inspector says that overcrowding does exist on a number of boats. Most of the one-cabin boats are registered for three adults, or two adults and two children under 12 years; in two-cabin boats registered for two adults and five children, the tendency is for the whole family to occupy one cabin only. Six fatal accidents to children occurred during the year, five by drowning and one by scalding; one girl of 7 years has fallen into the canal three times, and a boy of 11, already rescued 16 times, was nearly drowned last year. From the point of view of education, the exclusion of children from the canal boats, which is fast becoming an accomplished fact, is to be welcomed. As far as health is concerned they compare favourably with town children, the freedom of the daytime compensating for the narrow, unventilated cabins at night; the incidence of infectious disease has been slight. But it is evident that as time goes on there will remain little canal boat inspection for the Society to do.

UNSIGHTLY WARTS.

To the Editor of THE LANCET.

SIR,—Referring to Dr. G. S. Sander's request for advice as to the treatment of small, multiple soft warts on the back of the hand (THE LANCET, August 2nd, p. 256), I beg to say that I have successfully treated many such cases with liquor ferri perchloridi fort, B.P., as an escharotic, by carefully applying it with a small, blunt-pointed glass rod, avoiding the skin around the bases of the warts.—I am, Sir, yours faithfully,

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[1] Annual Report, 1923-24. Victory House, Leicester-sq., W.C.

and by the stimulation of certain areas on the cerebral cortex. Parsons[9] found that electrical stimulation of the cortex of cats, dogs, and monkeys, in the neighbourhood of the crucial sulcus and over a considerable area of the occipital region, produced wide dilatation of the pupils when the cervical sympathetic nerves were intact, and a dilatation of about a half or two-thirds that amount when those nerves had been divided.

Dilatation of the pupil caused by section of the third nerve may be increased by stimulation of the cervical sympathetic; and cocaine, which acts by stimulation of the terminals of the cervical sympathetic, will cause a pupil dilated by atropine to enlarge still further. Fright, such as that produced by a sudden and unexpected noise, causes the pupils to dilate widely, even whilst the retina is being stimulated by exposure to bright light. Wide dilatation of the pupil enlarges the field of vision by allowing rays of light to pass into the eye which, owing to their obliquity, would otherwise be cut off. Such an enlargement of the field of vision is of considerable importance to those animals which require a large range of circumferential vision to warn them of the approach of danger. In most of the ungulata, whose safety mainly depends on their rapidity of flight, an increased range of circumferential vision is further provided for by horizontally oval-shaped pupils.

Stimulation of the cervical sympathetic nerve, besides exciting into action the dilator muscle fibres of the iris, causes contraction of the two sets of unstriated muscle fibres in the orbit described by Müller—viz., that which causes widening of the palpebral fissure by retraction of the upper eyelid, and that which causes protrusion of the eyeball. An enlargement of the palpebral fissure and an increased prominence of the eyeball, like dilatation of the pupil, serve to increase the range of vision; the three symptoms are characteristic of fright. It seems, therefore, most probable that they have all three been evolved for the same purpose—that is, to enable animals to perceive and escape quickly from approaching foes.

The instinct of flight, which is usually evoked by the emotion of fear, may be called into action in different ways. The stimulus may be received through the auditory nerve from some sudden and unexpected sound; through the optic nerve by the perception of some approaching danger; or through the cutaneous surface by the sensation of pain. In whichever way elicited the fibres of the cervical sympathetic nerve become stimulated, causing contraction of the muscle fibres supplied by it, of which one set are those that dilate the pupil. Every anæsthetist knows that if an operation is commenced before a patient has become fully insensitive to pain, a skin incision will be followed by dilatation of the pupils. Claude Bernard,[10] in 1862, found that the experimental stimulation of the cerebral end of any sensory nerve was followed by dilatation of the pupils. Anderson describes how in a series of experiments he obtained such dilatation after the pupillo-constrictor tract had been divided, whereas he was unable to obtain it after the cervical sympathetic had been cut.

In the mydriasis brought about by emotional influences, acting through the sympathetic nerves on the dilator fibres of the iris, may be found an explanation of the influence which psychical conditions, such as those produced by worry and anxiety from bereavements or business losses, have in exciting the onset of glaucoma. Those of an emotional temperament manifest a predisposition to glaucoma, perhaps those who manage to suppress its outward signs more than those who give way to them. Females, the more emotional sex, suffer more frequently from glaucoma than males, especially the congestive type. Priestley Smith[11] estimated the ratio between the two sexes as 56·9 per cent. males against 43·1 per cent. females, and Kagoshima,[12] in Japan, as 61·9 per cent. females against 39·09 per cent. males. Widows seem specially liable to the disease. Thus I found out of the 117 cases 74 were females and 43 males; of the 74 females 38 were married, 27 widows, 7 single, 2 unrecorded; of the 43 males 31 were married, 8 widowers, 1 single, 3 unrecorded.

ANTAGONISM BETWEEN SPHINCTER AND DILATOR FIBRES.

Though in the reaction of the pupil to light in mammals the sphincter muscle is alone concerned, in respect to what is sometimes termed muscular tone some antagonism between the sphincter and dilator fibres appears to exist. In defective development, paralysis, and degeneration of the dilator fibres, the uncontrolled action of the sphincter muscle produces a condition of miosis. In Holth and Berner's[7] cases of congenital miosis they demonstrated defective development of the dilator muscle. In paralysis of the cervical sympathetic nerve-supply to the dilator muscle the pupil becomes contracted. The miosis met with in spinal disease, which though sometimes associated with loss of light reflex (Argyll Robertson pupil) may occur independently of it, is probably caused by a lesion of the cilio-spinal centre in the cord. Senile miosis is most likely due to degenerative changes in the dilator fibres, though of this at present there is no anatomical proof.

Congenital defects in the development of the sphincter muscle are only met with in association with gross deficiency in the formation of the iris. Apparently the sphincter muscle is not liable to senile degeneration as the dilator seems to be. When, however, it is paralysed with atropine the degree of mydriasis produced has been found to be decreased by section of the cervical sympathetic nerve, which seems to show that the unopposed antagonistic action of the dilator muscle produces a greater effect than that produced by mere paralysis of the sphincter. Contraction of the pupil has been frequently described as occurring in connexion with efforts to close the eye forcibly. It has been observed when the lids are kept apart by a speculum, whilst such efforts are being made. It has been suggested that this reflex is connected with the contraction of the orbicularis muscle, and that it is due to an overflow of stimulus passing from the nucleus of the seventh to that of the third. I would suggest that a more probable explanation is that the contraction of the pupil results from relaxation of the normal tone of the dilator muscle, associated with a relaxation of Müller's muscles, which raise the upper eyelid and protrude forwards the eyeball. When the eyelids are forcibly closed these two muscles, which, like the dilator fibres, are supplied by the cervical sympathetic nerve, would necessarily become relaxed.

The antagonistic action between sphincter and dilator muscles becomes strikingly manifest in diseased conditions, giving rise to the symptom which is termed hippus. A slight oscillation of the pupil after stimulation by light may sometimes be observed under normal conditions, but it becomes markedly increased when the conducting power for the afferent impulses of the light reaction are impeded, as in retrobulbar inflammation of the optic nerve.

CONSENSUAL REACTION IN RELATION TO BINOCULAR VISION.

Binocular vision, which is produced by the translation forwards of the eyes from the sides of the head so that the two fields of vision overlap, is present in some of the carnivorous fish, reptiles, and birds. In all these animals, however, there is complete decussation of the optic nerve fibres at the chiasma, so that the binocular vision is not stereoscopic vision, all the visual impressions received by the retina of one eye passing to the opposite side of the brain. All the afferent impulses for pupillary light reflex received from one eye likewise pass to the opposite side of the brain, and there is no consensual pupillary reaction. Amongst mammals there are some rodents who have complete decussation, and others, like rabbits, in whom it is almost complete. In the horse and calf, amongst the ungulata, it has been found that about one-sixth of the optic nerve fibres turn into the tract of the same vesicle at the pupillary margin, and run concentrically with the pupil in spaces in the stroma. When stimulated by light they expand antero-posteriorly, contracting laterally, so causing contraction of the pupil.

The formation of a screen in the front part of the eye with a central opening, capable of contraction and expansion, seems primarily to have been acquired for the purpose of regulating the amount of light admitted to the eye. In the eyes of cephalopods and fishes the static refraction is myopic and accommodation is for distance, produced by retraction of the globular lens into nearer approximation with the retina, without any alteration taking place in its curvature. These animals have no ciliary body and no suspensory ligament; the iris does not lie in contact with the lens and can play no part in accommodation.

Pupil Reaction in Fishes.

In fishes' eyes the muscles of the iris are but poorly developed, and the rapidity of reaction of their pupils to light is comparatively slow. In those of nocturnal habits, whose retinæ are probably particularly sensitive to light, the pupils in the daytime contract to an excessive minuteness (Beer). In some of the flat fish (as the thornback, *Raja clavata*) there is a projecting lobe from the upper border of the iris, which contracts over the pupil when the eye is exposed to bright sunshine. It consists of a crescent-shaped membrane with projecting processes at its free margin, and is composed of tissue similar to the stroma of the iris lined by pigment epithelium. In this animal, whose flat body-surfaces are truly dorsal and ventral, the eyes are situated dorsally and look directly upwards. It has no eyelids, and unless protected by some such pupillary curtain would be constantly exposed to the sun's glare. Flat fish, such as plaice (*Pleuronectes platessa*), in whom the body is flattened from side to side, not from above downwards, have their heads so twisted that both eyes are on the upper surface, but raised up from it so that their optical axes are directed laterally, and the pupils do not require protection by an extra lobe of the iris. In the eyes of many fish the membrane argentina of the choroid is continued on into the iris, where it forms a brilliantly reflecting surface, by which objects at the short range for which their eyes are focused when at rest can be illuminated. Possibly the sphincter muscle of the iris by its contraction to light may, in these animals, serve the subsidiary purpose of increasing the reflecting power of the membrane by making it tense.

The most remarkable form of adaptation in the eyes of fishes to suit different environments is that found in the *Anableps tetrophthalmus*, in which the cornea is divided into two halves by a dark strip of conjunctiva extending horizontally across it, and where the iris is perforated by two pupils, one opposite each division of the cornea. By this arrangement, and by the elevated position of the eyes on the surface of the animal's head, it is able to swim on the surface of the water, using the upper pupil and upper half of the cornea for aerial vision, and the lower pupil and lower half of the cornea for subaqueous vision. Though a different form of dioptric apparatus is necessary for vision in the two different media, for each a contractile pupil is required.

Contraction of Iris in Mammals a Reflex Act.

In the course of evolution the contractile power of the muscular tissue of the iris becomes changed, from one of direct action to the stimulus of light into a reflex act. No contraction of the iris tissue to light takes place in mammals when the iris tissue has been severed from its connexions with the central nervous system. It loses its phototactic action but retains its contractile power. In the reflex act of the pupil following the stimulation of the retina by light, the sphincter muscle, which is innervated by the third cranial nerve from fibres originating in its nucleus in the floor of the aqueduct of Sylvius, seems to be alone concerned. Several observers have found that after section of the third nerve variations in light produce no effect on the pupil. When the sphincter has been paralysed by the instillation of atropine no further dilation is effected by decreasing illumination. The dilator fibres of the iris, which are innervated by the cervical sympathetic, when they lose their phototactic powers, play, therefore, no part as an antagonistic to the sphincter in the pupillary-light regulating mechanism. Their action must have been evolved for some entirely different purpose.

EXPLANATION OF LONG COURSE OF FIBRES SUPPLYING DILATOR MUSCLE OF IRIS.

The nerve fibres supplying the dilator muscle of the iris take what at first seems to be a strangely long and circuitous course. Much experimental work has shown that, starting somewhere in the mesencephalon, they extend through the medulla oblongata into the lateral columns of the cord to the centrum cilio-spinale inferius in the dorsal region. They leave the cord by the ventral roots of the first, second, and third dorsal nerves to join the cervical sympathetic, from which they pass through the Gasserian ganglion to the first division of the fifth nerve and enter the eye with the long ciliary nerves. The excursion of these fibres down to the centrum cilio-spinale inferius in the dorsal cord seems to indicate that they were evolved at a time when, as in fish and amphibia, the cervical region was undeveloped, and that the displacement of the centre from the neighbourhood of the eye has been occasioned by the development of the neck.

On this matter I cannot do better than quote what Ferrier [8] has written:—

> The vasomotor nerves of the head and the dilator nerves of the pupil seem at first sight to pursue an unnecessarily roundabout path. Having their centres in the medulla oblongata, why, one asks, should they go all the way down to the upper dorsal region of the cord before emerging to join the sympathetics, seeing that anatomically they might reach their destination in a more direct manner? The explanation of this fact is without doubt to be sought for in embryology. I had, on purely physiological grounds, formed the speculation that the medulla oblongata should, as regards all organic functions, be looked upon as the direct continuation of the dorsal spinal cord, the cervical region being merely intercalated for the innervation of the upper extremities and their related parts. My friend Prof. Kitchen Parker, to whom I referred on this point, kindly pointed out to me facts of development which seem to me entirely in harmony with the speculation I had formed. Thus in the embryo of all animals, the heart is at first in close relation with the head and the cerebral vesicles, but ultimately, as development proceeds, comes to lie at some distance posteriorly. The distance is extremely variable in different classes of animals, and depends on the number of cervical segments which are developed. In osseous fishes, in which the cervical region is absent, the heart is in the closest relation with the head, and the first spinal nerve, succeeding the vagus, communicates with the second, and supplies among others the muscles of the pectoral fin, which is the homologue of the hand or arm in man. Therefore the region of the spinal cord, which, as regards function at least, corresponds to the lower cervical or upper dorsal segments in the monkey, comes in the fish immediately after the origin of the vagus. In the myxine, or hag, however, the heart is situated a very considerable distance posterior to the head—below the fortieth spinal segment. This has been conditioned by the development of a large number of segments for the powerful musculature of the upper part of the body. There is every reason for believing, however, that in the embryo hag the heart at first occupies the same position in relation to the head that it does in other embryos. As, therefore, the vagus elongates in proportion to the distance of the heart and viscera from the medulla oblongata, so also the spinal tracts which connect the face, originally short and direct, become elongated by the intercalation of the cervical segments which are developed for the innervation of the upper extremities and their annexes. Hence they ultimately emerge by the anterior roots of the upper dorsal nerves, and re-ascend in the cervical sympathetic to their destination.

DILATATION OF PUPIL FROM EMOTIONAL AND SENSORY STIMULI.

Dilatation of the pupil occurs not only from absence of light, but also as the result of the application of sensory stimuli to various parts of the body, and of physical influences. Experimentally it may be produced by the stimulation of the cerebral end of any sensory nerve, and by the stimulation of certain areas on the cerebral cortex. Parsons[9] found that electrical stimulation of the cortex of cats, dogs, and monkeys, in the neighbourhood of the crucial sulcus and over a considerable area of the occipital region, produced wide dilatation of the pupils when the cervical sympathetic nerves were intact, and a dilatation of about a half or two-thirds that amount when those nerves had been divided.

Dilatation of the pupil caused by section of the third nerve may be increased by stimulation of the cervical sympathetic; and cocaine, which acts by stimulation of the terminals of the cervical sympathetic, will cause a pupil dilated by atropine to enlarge still further. Fright, such as that produced by a sudden and unexpected noise, causes the pupils to dilate widely, even whilst the retina is being stimulated by exposure to bright light. Wide dilatation of the pupil enlarges the field of vision by allowing rays of light to pass into the eye which, owing to their obliquity, would otherwise be cut off. Such an enlargement of the field of vision is of considerable importance to those animals which require a large range of circumferential vision to warn them of the approach of danger. In most of the ungulata, whose safety mainly depends on their rapidity of flight, an increased range of circumferential vision is further provided for by horizontally oval-shaped pupils.

Stimulation of the cervical sympathetic nerve, besides exciting into action the dilator muscle fibres of the iris, causes contraction of the two sets of unstriated muscle fibres in the orbit described by Müller—viz., that which causes widening of the palpebral fissure by retraction of the upper eyelid, and that which causes protrusion of the eyeball. An enlargement of the palpebral fissure and an increased prominence of the eyeball, like dilatation of the pupil, serve to increase the range of vision: the three symptoms are characteristic of fright. It seems, therefore, most probable that they have all three been evolved for the same purpose—that is, to enable animals to perceive and escape quickly from approaching foes.

The instinct of flight, which is usually evoked by the emotion of fear, may be called into action in different ways. The stimulus may be received through the auditory nerve from some sudden and unexpected sound; through the optic nerve by the perception of some approaching danger; or through the cutaneous surface by the sensation of pain. In whichever way elicited the fibres of the cervical sympathetic nerve become stimulated, causing contraction of the muscle fibres supplied by it, of which one set are those that dilate the pupil. Every anæsthetist knows that if an operation is commenced before a patient has become fully insensitive to pain, a skin incision will be followed by dilatation of the pupils. Claude Bernard,[10] in 1862, found that the experimental stimulation of the cerebral end of any sensory nerve was followed by dilatation of the pupils. Anderson describes how in a series of experiments he obtained such dilatation after the pupillo-constrictor tract had been divided, whereas he was unable to obtain it after the cervical sympathetic had been cut.

In the mydriasis brought about by emotional influences, acting through the sympathetic nerves on the dilator fibres of the iris, may be found an explanation of the influence which psychical conditions, such as those produced by worry and anxiety from bereavements or business losses, have in exciting the onset of glaucoma. Those of an emotional temperament manifest a predisposition to glaucoma, perhaps those who manage to suppress its outward signs more than those who give way to them. Females, the more emotional sex, suffer more frequently from glaucoma than males, especially the congestive type. Priestley Smith[11] estimated the ratio between the two sexes as 56·9 per cent. males against 43·1 per cent. females, and Kagoshima,[12] in Japan, as 61·9 per cent. females against 39·09 per cent. males. Widows seem specially liable to the disease. Thus I found out of the 117 cases 74 were females and 43 males; of the 74 females 38 were married, 27 widows, 7 single, 2 unrecorded; of the 43 males 31 were married, 8 widowers, 1 single, 3 unrecorded.

ANTAGONISM BETWEEN SPHINCTER AND DILATOR FIBRES.

Though in the reaction of the pupil to light in mammals the sphincter muscle is alone concerned, in respect to what is sometimes termed muscular tone some antagonism between the sphincter and dilator fibres appears to exist. In defective development, paralysis, and degeneration of the dilator fibres, the uncontrolled action of the sphincter muscle produces a condition of miosis. In Holth and Berner's[7] cases of congenital miosis they demonstrated defective development of the dilator muscle. In paralysis of the cervical sympathetic nerve-supply to the dilator muscle the pupil becomes contracted. The miosis met with in spinal disease, which though sometimes associated with loss of light reflex (Argyll Robertson pupil) may occur independently of it, is probably caused by a lesion of the cilio-spinal centre in the cord. Senile miosis is most likely due to degenerative changes in the dilator fibres, though of this at present there is no anatomical proof.

Congenital defects in the development of the sphincter muscle are only met with in association with gross deficiency in the formation of the iris. Apparently the sphincter muscle is not liable to senile degeneration as the dilator seems to be. When, however, it is paralysed with atropine the degree of mydriasis produced has been found to be decreased by section of the cervical sympathetic nerve, which seems to show that the unopposed antagonistic action of the dilator muscle produces a greater effect than that produced by mere paralysis of the sphincter. Contraction of the pupil has been frequently described as occurring in connexion with efforts to close the eye forcibly. It has been observed when the lids are kept apart by a speculum, whilst such efforts are being made. It has been suggested that this reflex is connected with the contraction of the orbicularis muscle, and that it is due to an overflow of stimulus passing from the nucleus of the seventh to that of the third. I would suggest that a more probable explanation is that the contraction of the pupil results from relaxation of the normal tone of the dilator muscle, associated with a relaxation of Müller's muscles, which raise the upper eyelid and protrude forwards the eyeball. When the eyelids are forcibly closed these two muscles, which, like the dilator fibres, are supplied by the cervical sympathetic nerve, would necessarily become relaxed.

The antagonistic action between sphincter and dilator muscles becomes strikingly manifest in diseased conditions, giving rise to the symptom which is termed hippus. A slight oscillation of the pupil after stimulation by light may sometimes be observed under normal conditions, but it becomes markedly increased when the conducting power for the afferent impulses of the light reaction are impeded, as in retrobulbar inflammation of the optic nerve.

CONSENSUAL REACTION IN RELATION TO BINOCULAR VISION.

Binocular vision, which is produced by the translation forwards of the eyes from the sides of the head so that the two fields of vision overlap, is present in some of the carnivorous fish, reptiles, and birds. In all these animals, however, there is complete decussation of the optic nerve fibres at the chiasma, so that the binocular vision is not stereoscopic vision, all the visual impressions received by the retina of one eye passing to the opposite side of the brain. All the afferent impulses for pupillary light reflex received from one eye likewise pass to the opposite side of the brain, and there is no consensual pupillary reaction. Amongst mammals there are some rodents who have complete decussation, and others, like rabbits, in whom it is almost complete. In the horse and calf, amongst the ungulata, it has been found that about one-sixth of the optic nerve fibres turn into the tract of the same side. Neither in rodents nor in the ungulata is any consensual pupillary reaction to be detected; apparently in those of them in which semi-decussation takes place there is an absence of pupillary fibres in the uncrossed bundles. It is in the carnivorous mammals, to whom stereoscopic binocular vision is of some importance for the judgment of distances in pouncing on their prey, that consensual pupillary light reflex is first met with.

Wilfred Harris [13] found that experimental division of the optic tract on one side in cats produced distinct homonymous hemianopia, with the hemianopic pupil reaction, and with considerable diminution of the pupil reaction to direct light in the opposite eye, though its consensual reaction was brisk on exposure of the other eye to light. This indicates, as Wilfred Harris points out, that the decussating optic bundle is much larger than the uncrossed bundle in the cat, as Ramón y Cajal has figured, and therefore the light stimulus, when conducted only by the small uncrossed bundle from the opposite eye, is much more feeble in causing pupil contraction, than when it is conducted by the large decussating bundle from the nasal side of the retina on the same side. In man, in cases where one optic tract is affected by disease, and where there is hemianopic pupil reaction, the briskness of the two pupils to light is nearly equal, whichever pupil is exposed to light. From which, as Harris says, we may infer that the size of the uncrossed bundle in man, and probably also in monkeys, is proportionally larger than in cats.

The highest form of stereoscopic binocular vision is that in which impressions from each macula become super-imposed on each side of the brain. The fovea centralis is only met with in mammals amongst apes and man. It has been developed as the result of arboreal life in which the fore limbs are used for prehensile purposes, and for picking up and conveying food to the mouth. With the development of acute central stereoscopic vision there has arisen the capacity of accommodation and convergence, and associated contraction of the pupil.

Reaction of Pupils in Association with Accommodation and Convergence.

The lowest mammals have little if any power of accommodation. In the echidna and in the great ant-eater the ciliary muscle is practically non-existent. In rabbits only a few scanty fibres are recognisable. In the ungulata longitudinal fibres form a considerable band, which becomes more pronounced in the carnivora. The aquatic carnivora, such as seals and otters, require to see in two different environments, air and water. The similarity of the refractive index of the cornea and water tends to render them, when in that media, highly hypermetropic, to overcome which they have developed considerably their intra-ocular muscles, so increasing their powers of accommodation. The sphincter muscle of the iris in these animals is unusually large, extending even up to its periphery. In apes and man amongst mammals the power of accommodation and the ciliary muscle reach their greatest development.

In mammals which have their eyes situated laterally in the head, as in most of the rodents, no convergence can take place. In the ungulata, when their attention is suddenly attracted, some movement from divergence toward parallelism can be detected. In the carnivora more obvious attempts at convergence take place. It is, however, only when we come to the monkeys which have developed a fovea with a high degree of central acuity of vision, that the power of converging the optical axes becomes a prominent feature. Contraction of the pupils, by cutting off circles of diffusion, must assist those animals whose eyes in the static condition are focused for distance, in seeing near objects apart from any accommodation which may take place. In a paper entitled "Apparent Accommodation in Aphakia," which I read at the Ophthalmological Society in 1915, I showed that after the removal of soft cataracts the presence of a small central hole in the capsule, together with a freely acting pupil, enables a patient to obtain full acuity of central vision both for far and near with the same lens. For animals requiring acute central stereoscopic vision for different distances the power of varying the size of the pupils in association with accommodation and convergence must be of great assistance. It is a form of pupillary reaction which has been evolved much later than, and quite independently of, the pupillary light reflex. The light reaction is a simple reflex act in which the centres in the mesencephalon are alone involved. The reaction of the pupils in association with convergence is not a simple reflex act, but an involuntary act which has become linked up with a voluntary one represented by centres in the visual cortex.

Contraction of the pupils in association with convergence without accommodation has been definitely demonstrated, but it is very doubtful if contraction takes place in association with accommodation apart from convergence. All three movements are connected with different parts of the third nerve nucleus; the impulses stimulating both the ciliary muscle and the sphincter muscle of the iris pass through the ciliary ganglion and enter the eyeball along the short ciliary nerves. It is probable that accommodation and contraction of the pupil, though not themselves definitely connected, both bear the same relation to convergence, and are both together stimulated into action by that voluntary movement under the control of higher centres in the cerebral cortex.

The independence of the pupillary reactions in connexion with light and convergence, both as regards their evolution and control, is of considerable interest in connexion with diseased conditions where one mode of reaction may be destroyed whilst the other remains unimpaired. In the Argyll Robertson phenomenon, where the reaction to light is lost whilst that to convergence remains, and which is such a common accompaniment of tabes, the lesion is probably one affecting the centripetal pupillary light reflex fibres somewhere between the optic tract and the oculo-motor nucleus, though as yet its site has not definitely been demonstrated by anatomical investigation.

The opposite condition, that of loss of pupillary reaction in association with convergence whilst that in connexion with light remains, is of much less frequent occurrence. It has been met with as a congenital defect, in rare cases in connexion with tabes, in cases of syphilitic basal meningitis and tumours of the corpora quadrigemina. A few cases of paresis of convergence without loss of conjugate movements in any direction have been recorded. Thus Henry Eales,[14] in 1884, described the case of a girl, aged 13, in whom, without any other sign of disease, there was complete paralysis of convergence and accommodation, the bilateral conjugate movements, both upwards and downwards and from side to side, being unimpaired. Though both pupils acted freely to light they did not contract when she looked at near objects.

The close association of the action of the pupils with convergence is also well demonstrated by a case recorded by Holmes Spicer [15] in 1002. It was that of a man, aged 44, who 15 years previously had primary syphilis and presented symptoms of early tabes. His pupils did not react to light and his convergence was weak. When he looked steadily at a near object his visual axes were parallel and the pupils small and equal to 2 mm. If one eye was covered it diverged and at the same time the pupil of the fixing eye as well as of the covered eye slowly dilated to 8 mm. On bringing both eyes into action again the visual axes became parallel and the pupils contracted. His convergence being weak to maintain binocular vision for distance, a strong effort at convergence was necessary; the association of the action of the pupils with convergence caused a marked contraction of the pupils. When one eye was covered it diverged, relaxation of convergence took place, and at the same time the pupils dilated.

EVOLUTION OF INTRA-OCULAR MUSCLES.

It is generally agreed that mammals in the process of evolution branched off at an early date, as a different stem from reptiles and birds, from some common reptile root. The sauropsids (under which term reptiles and birds are classed) and mammals each present anatomical characteristics which, whilst common to all their members, are markedly different in the two groups. This applies to the structure of their intra-ocular muscles; in the sauropsids they are composed of striped fibres and in mammals of unstriped. The first discovery of an internal muscular apparatus in the ciliary region was made in birds in 1813 by Dr. Crampton, afterwards Sir Philip Crampton, Bart., who was three times President of the Royal College of Surgeons in Ireland. Though earlier writers had put forward theories of accommodation which involved the presence of muscular fibres none had previously demonstrated their existence by dissection.

Reptiles, such as lizards who feed on small insects which they snap up rapidly with their tongues, require not only a very high degree of acuity of vision, but also the power of accommodating up to within a few centimetres. The chameleon which has remarkable powers of rotating its two eyes in different directions, can converge their axes on the victim it is about to catch and devour. The rapacious birds which sight their prey from enormous distances, and those of the sparrow kind which feed on minute seeds and insects, possess not only a visual acuity but also a power of accommodation vastly superior to that of man. It is not surprising, therefore, to find that the iris, which plays such an important part in association with accommodation, is provided with more extensive and more rapidly active muscular tissue in reptiles and birds than in mammals.

The general plan of the arrangement of the striate muscle fibres in birds and reptiles is in two planes: the anterior sphincter fibres running a circular course, and the posterior dilator fibres having a radial direction. In birds there is a marked development of the circular fibres at the periphery of the iris where they form a distinct prominence on its surface. Variations from this general plan are met with in different species. The striated sphincter pupillæ muscle in birds has, like the unstriated sphincter in mammals, been shown by Nussbaum to be formed from epithelial cells at the pupillary margin of the optic cup. Lewis has further shown that the more peripheral muscle fibres in bird's irides are produced from cells budding off the anterior pigment epithelial layer some distance external to the pupillary margin. Crampton's muscle in birds, Lewis[16] found, like the ciliary muscle in mammals, to be derived from mesoblast. As the optic nerve fibres decussate completely at the chiasma in birds and reptiles, they have no consensual reaction of the pupils to light and no stereoscopic vision, as in man. Birds, however, possess some voluntary control over the movements of their pupils, this voluntary movement being bilateral whilst the light reflex is only unilateral.

EVOLUTION OF NUCLEUS OF THE THIRD NERVE.

The researches of Davidson Black[17] and others on the phenomenon of Kappers's[18] neurobiotaxis (i.e., the shifting of nerve cells in the central nerve system in the direction of the point whence the majority of stimuli reach them) have shown that in the phylogenetic development of the third nerve nucleus certain changes take place which may be correlated with elaboration in the intra- and extra-ocular movements. Anatomically the third nerve nucleus in man and monkeys is found to be composed of different groups of cells. There are two main lateral ones composed of large cells, crescentic in shape with the concavity outwards; and a median one, known as the nucleus of Perlia, also composed of large cells. Between the anterior rounded extremities of the lateral crescentic nuclei, almost touching the middle line, are two groups of smaller cells which are termed the Edinger-Westphal nuclei.

The most recent experimental work on the association of different parts of this nucleus with the control of the intra-ocular muscles tends to prove that the Edinger-Westphal groups of cells are centres for constriction of the pupil, that the centre for convergence being situated on the inner aspect of the central part of the median group of cells, and that for accommodation at its posterior end. In the lowest species of fish and in sharks the nucleus of the third nerve is found to consist of a group of cells undifferentiated into any specific areas. Some differentiation away from this primitive condition is met with in ganoid and teleostean fish, but not in the dipnoans or lung fish, which latter present the most distinct signs of transition between fish and amphibians. Such differentiation can, therefore, hardly be regarded as a precursor of the subgrouping which has been found in anuran amphibia, reptiles, birds, and mammals. Writing on this matter Davidson Black says:

> It would thus seem probable that the factors which determined the anuran oculomotor cell-arrangement must have appeared comparatively late in phylogeny. The eyes of most fishes are normally focused for near objects when at rest, and since the eyes of most amphibians, reptiles, birds, and mammals are normally focused for distance, it is not improbable that the chief original cause of the amphibian oculomotor specialisation may be seen in the readjustment of accommodation which must have taken place in phylogeny during the evolution of the amphibian type.

Kappers pointed out how, in the arrangements of the elements of the anuran amphibian oculomotor nucleus, a first stage in the evolution of the more highly specialised sauropsidan condition may be recognised. More recently the evolution of the Edinger-Westphal nuclei, the blending in a central raphé of the nuclei of the internal recti, with the growth of the nucleus of Perlia, in association with the development of accommodation and convergence, has been depicted in a graphic fashion by Brouwer.

CENTRES FOR CONVERGENCE AND DIVERGENCE.

In spite of the large amount of experimental work that has been done in connexion with the associated movements of the eyes, there is still much to be learnt regarding the cortical centres for convergence and divergence, and as to the course taken by the fibres which connect them with nuclei of the ocular nerves in the aqueduct of Sylvius. Such evidence as we have seems to show that in the cerebral cortex there are centres both in the occipital and frontal lobes, the bilateral stimulation of which gives rise to these associated movements of the eyes. In the occipital lobes the centres for ocular movement are situated in close proximity to the visual centres, and seem closely associated with sensory stimuli, the movements being made for the purpose of fusing images received from the two eyes in the desire for binocular vision. In the frontal lobe the centre for convergence has been located near the angle of the precentral fissure (Sherrington), and that for divergence in front of the middle of that fissure (Bechterew); they seem to be more particularly connected with voluntary movements.

As the result of a consideration of his own and others' experiments, of the effects on the pupil from stimulation of various areas in the cerebral cortex, Parsons[9] says it seems probable that there are foci for pupil constriction both in the frontal and occipital areas, but that they are often masked by the dilator effects, which are much more readily produced. He sums up his observations by saying:—

> It is unlikely that we are dealing with "centres" for the pupils, in the ordinary sense of the term. We have found that the effect is most specifically obtained from the areas which are concerned with ocular movements, whether from the motor or the sensory side. Moreover, it would seem that the effect is indissolubly connected with those movements, and does not occur in their absence. Hence it is most reasonable to conclude that the phenomenon is an associated effect.

In such experiments I would suggest that it is most probable that the centres for convergence or divergence, being either excited or inhibited, the associated movement of either contraction or dilatation of the pupil is produced.

Summary.

1. The muscle fibres of the iris are developed from cells of the outer layer of the secondary optic vesicle, cells which in the hinder part of the eye are known to possess a capacity for movement in the direction of light.

2. In some of the cold-blooded vertebrata the muscles of the iris have been found to react directly to the stimulus of light, apart from any nervous impulse.

3. In the warm-blooded vertebrata the direct phototactic action of the iris is lost, and becomes replaced by a more quickly acting reaction due to nervous mechanism, the afferent impulse for which is received through the retina and optic nerve.

4. That the dilator fibres of the iris in warm-blooded animals are not concerned in the reflex light-regulating mechanism, and that their action must have been evolved for a different purpose.

5. That these dilator fibres are supplied by the cervical sympathetic nerve which also supplies unstriated muscle fibres in the eyelid and orbit, muscles which become excited into action in connexion with the emotion of fear.

6. Enlargement of the pupils, increased prominence of the eyeballs, and widening of the palpebral fissure increase the range of circumferential vision, thereby assisting an animal in perceiving the early approach of danger and in obtaining safety in flight.

7. Consensual reaction of the pupils to light is of assistance in stereoscopic binocular vision, in which impressions received from the retinæ of the two eyes become superimposed on the same side of the brain. It is only met with in the higher mammals, in which semi-decussation takes place at the optic chiasma.

8. The reaction of the pupils in association with accommodation and convergence has been evolved much later, and quite independently, of their reaction to light. In it the two involuntary acts of contraction of the sphincter of the iris and of the ciliary muscle become associated with the voluntary one of convergence, which is represented by centres in the visual cortex.

9. Convergence can only take place in mammals where the eyes are situated in the front of the head, and where the optic axes are parallel in direction. It only becomes a pronounced feature in man and monkeys in whom a high degree of central acuity of vision has been acquired.

10. Correlated with the increasing diversity of actions of the sphincter muscle of the iris there is an increased functional specificity of the cells of the third nerve nucleus.

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ON THE RELATION BETWEEN GENERAL PARALYSIS AND SOMATIC SYPHILIS.*

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What is it that in a relatively small number of cases causes the *Spironema pallidum* to invade the nervous system? To obtain an answer to this question is the object of our work.

Two possibilities present themselves: First, that the controlling factor lies in the organism itself or, in other words, that a neurotropic strain of spirochæte exists; secondly, that tissue predilection is the deciding factor, and that the nervous system is infected because it offers less resistance to the invading organism. It is well known that the tissues of certain individuals wear out more easily than do those of others. A nervous system having what is termed by Bolton[1] this "defective durability," is liable, when invaded by an organism such as the spirochæte, to fall a prey to it.

Our original question is not a mere academic one, and the correct answer will prove of immense importance in practical medicine. For this reason the research is of general interest. General paralysis is chosen as our type of neuro-syphilis because the diagnosis by modern serological methods is certain and can be confirmed by exactly determined post-mortem findings; also because it is the only disease of this nature concerning which adequate pathological details in sufficient number could be collected.

Neuro-syphilis may be divided into two varieties: (1) The meningo-vascular type, where the supporting structures are primarily affected and the nervous tissue only secondarily. Examples are gumma and gummatous meningitis at one end of the scale, and purely vascular lesions, such as cerebral softening and so-called myelitis, at the other. Between these two lie the intermediate forms which may be classed generally as disseminated cerebro-spinal syphilis. It is contended by us that this meningo-vascular type is not in the anatomical sense *neuro*-syphilis at all, but rather merely a syphilitic invasion of those nutrient and supporting structures which are necessary for the functioning of the nervous system. (2) The variety in which the attack falls upon the nervous tissue proper, so-called parenchymatous neuro-syphilis, of which general paralysis and tabes are the only representatives.

If there be a special neurotropic variety of spirochæte responsible for general paralysis either it should attack the nervous system only, or, if it does attack the somatic system, then the findings here should be slight, or at any rate different from those found in non-nervous syphilis.

A study of the Wassermann reaction in cases of general paralysis led us to assume at the outset that somatic lesions would be found, for in all the samples of blood in these cases examined by us without exception a strongly positive reaction was obtained. If this means that the body tissues contain living spirochætes or their products, then the matter resolves itself into a search for these lesions, knowing that they must be present.

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* A paper read before the Liverpool Medical Institution.

Analysis of Post-mortem Records of General Paralysis.

The first part of the research consists of the analysis of the records of post-mortem examinations upon cases of general paralysis made by one of us (G. A. W.) at the Lancashire County Mental Hospital, Rainhill. Out of a total of 2622 autopsy records there were 529 cases of general paralysis; 1485 of the 2622 autopsies were upon male and 1137 upon female cases. The 1485 male cases provided 429 examples of general paralysis, a percentage of 28·9; the 1137 female cases provided 110 examples, a percentage of 9·6 total female autopsies. This last figure is striking, showing as it does that the disease in this institution is only about three times more common in men than in women; this is a very much lower ratio than that usually given. In addition to these cases there were records of two male and nine female juvenile paralytics.

For the purposes of this research in order to maintain a uniform standard only those records made by one of us (G. A. W.) were used—viz., 424 male and 105 female cases. In a few it had only been possible, for various reasons, to make a partial examination, but in all the skull and brain had been examined. All the cases had been proved by examination of the brain to be undoubted cases of general paralysis, and in several the spirochæte had been demonstrated in the brain substance. No reference is made here to the pathological findings with regard to the brain and nervous tissue, as the object of our work was to discover, by examination of cases known to be general paralysis, any evidence for or against the theory that a special variety of spirochæte is responsible for neuro-syphilis.

As post-mortem findings vary with the age of the subject, we first analysed the cases with regard to the age at death. (Table I.)

TABLE I.—*Age Incidence at Death.*

Age period.	Males.	Females.	Age period.	Males.	Females.
20–25	4	0	51–55	40	11
26–30	21	5	56–60	28	5
31–35	67	11	61–65	6	1
36–40	101	26	66–70	5	0
41–45	81	27	70–75	1	0
46–50	72	19	Age unknown.	2	—

The average age at death of 426 males was 42·6 years, while that of 105 females was 42·4 years. These figures show that the largest number of males die between the ages of 36 and 40 years, the figure for this period being considerably higher than that for the age period 41–45, whereas in women the percentage death-rate for these two periods is practically the same. The average age at death, however, shows remarkable agreement.

Next our attention was directed to the records dealing with evidences of syphilitic infection on the external surface of the body with the following results:—

(*a*) Well-defined scars of the primary sore were found in 81 of the male cases, indefinite scars in a further 23, and inguinal scars in a further 6 cases, making a total of 110, a percentage of 26. This figure, so far as our observations go, is considerably higher than that found in the venereal department records, and it is particularly interesting in view of the oft-repeated statement that general paralysis frequently occurs in those individuals who never knew that they had been infected with syphilis.

(*b*) Pigmented scars on the legs were found in 36 male cases, and in only three of the females.

(*c*) Another extraordinary finding, which has no direct bearing on the present question, but which is of sufficient interest to warrant its mention, is the incidence of elaborate tattooing in these cases. Of the 424 male paralytics 102 were thus adorned, a percentage of 24, whereas the percentage of cases showing tattooing among 899 other male lunatics was only 6·2. Of the 105 women paralytics the incidence of tattooing was 5·9 per cent., while in 1032 other female lunatics only four showed this (0·38 per cent.). The tattoo marks in the female non-paralytics were simple initials only, and among the males those found in the non-syphilitic cases tended to be of a much simpler type.

Statistics concerning the condition of the skull revealed an increase in density in the large majority of the cases examined. The typical paretic skull is much thicker and harder than normal, with a disappearance of the diploë and its replacement by solid bone. Well-defined symmetrical bossing of the frontal bones was noted in a few instances, while a roughening or corrugation of the inner table of the frontal bone, together with a deepening of the groove for the middle meningeal artery, were fairly typical findings. Much rarer were irregular areas of cranial thinning. (Table II.)

TABLE II.—*Statistics as to the Condition of the Skull.*

Condition.	Male.	Female.
Normal	45	10
Density increased	59	17
Density much increased	174	44
Density very much increased ..	124	28
Density extremely increased ..	12	5
Bosses	11	6
Paget's disease	0	1

Most important changes were found in the cardiovascular system. The aorta in all but seven cases showed some pathological change, the condition found in 392 instances being syphilitic aortitis, apparently exactly similar to that met with in somatic syphilis. This aortitis is characterised by the presence of comparatively large raised areas of pearly-white fibrosis, in which later contraction takes place, resulting in very typical radiating scars. The pearly nodules contain no fat, they do not ulcerate, and no lime salts are deposited in them. The patches occur first and are usually most marked in the first part of the thoracic aorta, in this way differing from ordinary atheroma which begins, and is most marked, in the descending part of the thoracic and in the abdominal aorta. The pearly-white patches occur in quite young persons; in our series they were found in all of the 18 cases between 21 and 30 years of age. In the older subjects it is common to find ordinary atheroma with ulceration and calcification associated with the syphilitic condition. This is due to the other causes of arterial degeneration coming into action. We have, therefore, tabulated (Table III.) the aortic condition into three classes: (1) Pearly patches only; (2) pearly patches with ordinary atheroma; (3) ordinary

TABLE III.—*Showing the Condition of the Aorta in G.P.I. at the Different Age Periods.*

Age period.	Aorta normal.	Extent.	Pathological change.		
			Pearly patches.	Pearly patches & atheroma.	Atheroma only.
21–30	1	P.	10	0	0
		M.	5	0	0
		V.M.	3	0	0
31–40	2	P.	48	0	5
		M.	37	1	1
		V.M.	48	1	3
41–50	4	P.	23	1	4
		M.	25	3	3
		V.M.	71	12	1
51–60	0	P.	10	0	1
		M.	9	2	1
		V.M.	27	18	2
61–70	0	P.	1	0	0
		M.	2	0	0
		V.M.	5	3	0
75	0	V.M.	0	0	1
Total	7		324	41	22

P. = Present. M. = Marked. V.M. = Very marked.

atheroma only. As there were no essential differences in men as opposed to women in this series the figures have been added together. It is extraordinary that there were only seven normal aortas in the whole series, and of these four were in men between the ages of 41 and 50.

We were struck by the unexpected finding that the incidence of aneurysm is rare. Though slight dilatation of the aorta is fairly common, being found in 30 of our cases, there were only two saccular aneurysms and one of the fusiform variety. Of the saccular aneurysms one was in a woman who died from its rupture. It is remarkable that though the first part of the aorta is affected in these cases the heart valves usually escape. In this series the valves, usually the mitral, were thickened in 22 cases, and showed ordinary atheroma in nine cases only. One of us (G. A. W.) has demonstrated spirochætes in the aortic lesions in cases of general paralysis. Another remarkable fact is that true endarteritis obliterans is rarely found in the cerebral arteries in these cases, the common change being a thickening or wiry condition of the smaller arteries. We have analysed the condition found in our series into three classes: (1) Those showing increased density of the smaller arteries; (2) those showing a fibrous nodular condition; and (3) those showing ordinary arterio-sclerosis only. Thirty-two males and thirteen females only had normal cerebral arteries. (Table IV.)

TABLE IV.—*Showing Condition of the Cerebral Arteries in G.P.I.*

1. Increased density of smaller arteries.		
Some increase	159 males,	31 females.
Marked increase	113 „	28 „
Very marked increase ..	45 „	13 „
2. Arteries show fibrous nodules.		
Present	39 males,	4 females.
Marked	25 „	5 „
Very marked	5 „	3 „
3. Arteries show ordinary arterio-sclerosis.		
Present	16 males,	3 females.
Marked	11 „	3 „
Very marked	9 „	2 „
Extremely marked ..	1 male,	0 „
Arteries normal	18 males,	13 „

Examination of the internal organs revealed certain pathological conditions. The spleen, kidneys, suprarenals, and liver showed an increase in the amount of fibrous tissue present. This increase takes the form of a diffuse fibrosis, so that the organ feels harder and heavier than normal. This change is most marked in the spleen, less so in the kidneys, and least of all in the liver. The typical changes in the kidneys will not be confused with ordinary cirrhosis, for it occurs in much younger persons, its distribution is different, and it is not associated with the presence of small cysts. It is peculiar that in the livers examined no scarring, such as is so common in syphilitic cases in general hospitals, was noted. In many of the cases, especially those which had an associated tuberculosis, the liver was fatty; in spite of this an increased fibrosis was obvious in many of them. Marked fibrosis is common in the testicle, but we have no exact figures as to the numbers.

Details of Fibrosis of the Solid Organs.

The degree of fibrosis was divided into four groups—viz., slight increase (+), distinct increase (+ +), great increase (+ + +), very great increase (+ + + +). (Table V.)

Though it may be regarded as a pathological axiom that syphilis produces fibrosis, yet it is common knowledge that with advancing age the density of the tissues may increase from various causes. In order to determine whether the age at death had any relationship to the density of the fibrosis, we have tabulated (Table VI.) the various degrees of fibrosis in the different age-periods.

TABLE V.

Organ.		No. examined.	Normal.	Degree of increase of density.					Other conditions.
				+	+ +	+ + +	+ + + +	Total	
Spleen	(M.)	316	1	15	80	185	30	310	5
	(F.)	83	0	7	28	41	4	80	3
Kidneys	(M.)	316	3	6	52	160	78	296	17
	(F.)	83	2	8	17	40	11	76	5
Liver	(M.)	316	3	46	104	123	18	291	22
	(F.)	83	2	12	30	14	3	59	22

M. = Males. F. = Females.

TABLE VI.—*Density of Fibrosis of Solid Organs at Different Age-Periods (Males).*

Organ.	Age-period.	Fibrosis. No. of cases.	Amount of fibrosis.			
			+	+ +	+ + +	+ + + +
Spleen ..	–20	1	0	0	1	0
	21–30	18	0	4	13	1
	31–40	117	4	30	66	17
	41–50	110	5	30	68	7
	51–60	53	3	12	34	4
	61–70	10	2	4	3	1
	Over 70	1	1	0	0	0
Kidneys ..	–20	1	0	0	1	0
	21–30	18	0	0	11	7
	31–40	112	1	14	57	40
	41–50	105	0	26	58	21
	51–60	51	3	10	28	10
	61–70	9	2	2	5	0
	Over 70	0	0	0	0	0
Liver.. ..	–20	1	0	1	0	0
	21–30	18	1	4	12	1
	31–40	109	12	39	51	7
	41–50	105	21	36	43	5
	51–60	49	10	21	14	4
	61–70	8	2	2	3	1
	Over 70	1	0	1	0	0

A perusal of Table VI. clearly shows that the age of the patient has no relation to the amount of fibrosis present—for example, 72·2 per cent. of the cases between 21 and 30 years of age had a + + + fibrosis of the spleen, and 64 per cent. of those between 51 and 60. While in the case of the kidneys 61·1 per cent. between 21 and 30, and 54·9 per cent. between 51 and 60 had a + + + fibrosis. This is in accordance with the findings of other observers who have described marked fibrosis in early cases of general paralysis dying from some intercurrent disease. These results also go to disprove the theory that the fibrosis is not due to the syphilis, but to the associated septic conditions which frequently occur at the termination of long-standing illness. Other syphilitic lesions found were—four instances of gummata of the testes, kidney, spinal ganglion, and brain, the last being in a woman; three cases (two men and one woman) of syphilitic meningitis, and one female case of syphilitic osteitis. Interstitial keratitis was fairly common.

With regard to the presence of associated pathological conditions, it is interesting to note the relative frequency of tuberculosis. Ninety-seven (30 per cent.) of 324 complete male, and 32 (38·5 per cent.) of 83 complete female autopsies showed evidence of this disease. (Table VII.)

TABLE VII.—*Tuberculous Lesions in Cases of G.P.I.*

	Males.		Females.
Active T.B. of the lungs ..	20	......	19
Old T.B. of the lungs	75	......	13
T.B. ulceration of the intestines	8	......	6
T.B. Fallopian tubes	—	......	6
T.B. pancreas	1	......	0
Acute pneumonic phthisis	1	......	0

Eighty-four of the cases died of pneumonia, and in 14 of these gangrene of the lung had supervened. This percentage of gangrene appears to be much higher than that found in ordinary general hospital practice. Concerning the other organs, little remains to be said, but one further fact is worthy of note. As compared with the genital scars in the males and the evidence they provide of old venereal infection, a study of the Fallopian tubes in women paralytics is of interest. Of the 83 complete female post-mortem examinations, 57 showed old tubal adhesions, a percentage of 68·7; a few of these were undoubtedly tuberculous, but apparently venereal disease was responsible for the majority. The percentage of old tubal adhesions among the ordinary asylum female population is placed at 12.

It will be remembered that this study of the post-mortem findings was undertaken with the object of discovering what, if any, signs of somatic syphilis were present in cases of general paralysis, in order to support or disprove the theory that this disease is due to a special strain of spirochæte which attacks the nervous tissues only. It has been asserted that the cases which develop general paralysis often have had very slight clinical signs in the primary and secondary stages. One would therefore be led to expect lesions in the somatic system in cases of general paralysis to be but slight, or at any rate to be different from those found in non-nervous cases.

We have shown that somatic lesions do occur in general paralysis, that these are by no means slight, and that they differ in no marked respect from those found in syphilitic cases in general hospitals. These results are of particular interest when it is remembered that although attention has been drawn to the subject by Bolton, in other modern text-books on neurology and psychiatry but scanty mention is made of the presence of somatic lesions in this disease.

Comparison between Syphilis among the Asylum Population and that in the General Community.

The next section of our work deals with the incidence of syphilis among the asylum population as compared with that in the general community. If parenchymatous neuro-syphilis depends upon an inherent weakness of the nervous system then there ought to be a difference in these two figures.

With regard to the incidence of syphilis in the general population a perusal of the literature shows that this is by no means easy to determine. The most extensive and probably the most accurate Wassermann surveys have been made in America, but here the presence of the coloured race complicates matters considerably. Allowance for this factor cannot always be made, since in some of the statistics the author omits to mention whether or not coloured patients were included.

Williams[2] examined clinically and serologically what he calls "a group of individuals representing the great American middle-class population." None of this group, numbering 912 persons, was known or suspected to have syphilis. The percentage of strongly positive Wassermann reactions was 4·4. Vedder[3] reports that in 1916 13 per cent. of 11,933 accepted recruits in the U.S. Army were Wassermann positive, as also were 15 per cent. of 856 candidates for the police force in Washington, and about 5 per cent. of 3203 candidates for commissions in the army. It would appear that in the same locality 5·8 per cent. of hospital admissions showed serological evidence of syphilis. Warthin[4] attacked the problem from a different standpoint. By necropsy study he found that 30 per cent. of bodies showed some pathological evidence of syphilis. This figure may be contrasted with that arrived at by Symmers,[5] who states that post-mortem statistics show that less than 7 per cent. of bodies reveal anatomical evidence of the disease, while in the living subject the Wassermann reaction is positive in over 25 per cent. of all persons investigated. Jeans[6] from the American literature has collected statistics among adults admitted to hospitals and dispensaries (V.D. wards excluded), and his findings may be presented in table form. (Table VIII.)

TABLE VIII.

Town.	Author.	Number of cases.	Number W.R.+	Percentage.
Baltimore ..	Walker	1,080	116	10·8
Boston.. ..	Walker and Haller	4,000	600	15·0
Chicago ..	Moore	418	56	13·4
Ann Arbor ..	Peterson	2,771	160	5·8
San Francisco	Whitney	6,995	518	7·4
	Totals	15,264	1450	9·5

The same author also quotes a Wassermann survey among married pregnant women. The figures are as follows (Table IX.):—

TABLE IX.

Town.	Author.	Number *of cases.*	Percentage of W.R. +
Chicago ..	Falls & Moore	116	10·6
Brooklyn ..	Comminsky	1822	8
Brooklyn ..	Judd	892	7·9
Philadelphia	Williams & Kohner	40	7·5
New York ..	Ottenburg	2488	11·5
	Totals	5358	9·66

Rosenberger,[7] in the Philadelphia General Hospital, states that 4430 blood Wassermann reactions were made during the year 1916. Of these 24·4 per cent. were positive, but, since the hospital has a mental department attached, this figure is probably too high for our purpose.

Much work appears to have been done on the frequency of hereditary syphilis. Perhaps in this connexion the following quotation will suffice: "The amount of hereditary syphilis among the hospital infants and children in four large cities of U.S.A.—New York, St. Louis, San Francisco, and Chicago—appears to range from 2 to 6 per cent." (Churchill and Austin[8]). Very thorough investigations have been carried out upon Panama Canal zone workers by Qualls.[9] The latent syphilitic infection among coloured male employees in this region is extremely high, 23·7 per cent., as compared with 2·3 per cent. among white employees. The total syphilitic infection among white surgical patients was 15 per cent., 981 blood samples being examined. Boudreau,[10] working at Auburn Prison, New York, found that 16·85 per cent. of the males and 33·85 per cent. of the females gave a positive Wassermann reaction.

Without quoting further statistics it will be evident that the percentage of syphilis among the general population is considerable. Thom[11] remarks:—

> "The incidence of syphilis in the United States, including the inherited as well as the acquired form, has been variously estimated at from 10 to 20 per cent. The former is the percentage which I believe to be approximately correct in the white race. In the negro I believe the percentage to be much higher, approximately 30 per cent."

Jeans[6] thinks a figure of 20 per cent. is probably nearer the truth.

Assuming, then, that the incidence of syphilis among the general population is approximately 10 per cent. we now pass to the study of the same problem among asylum inmates. For this purpose the blood and spinal fluid of every new admission to the Lancashire County Mental Hospital, Rainhill, during a period of almost a year were examined by us. Of the 305 cases examined 47 were clinically general paralytics, the diagnosis being confirmed serologically in 42. Of the 258 non-syphilitic psychoses 11·7 per cent. gave a positive Wassermann reaction. The total percentage of syphilis in this institution was, therefore, 23·6, and the figure 11·7 per cent. may be taken as representing the incidence of the disease among the non-paralytic asylum population.

favour the defective durability hypothesis, since such a weakness would naturally occur in several members of the same family. Finally, in this connexion we can find no evidence in support of Mott's contention that social class or type of work play a part in the causation of parenchymatous neurosyphilis.

The results obtained by bacteriologists, which ought to have been the most weighty of all, are, unfortunately, most indefinite. Ever since Noguchi, about 1912, first cultivated the *S. pallidum* many attempts have been made to differentiate strains of the organism depending upon morphological and cultural characteristics and behaviour on inoculation. Some evidence has resulted suggesting that dermotropic and neurotropic strains of the virus exist, but many difficulties have been encountered.

In conclusion, ample evidence of the presence of somatic lesions in general paralysis has been given. These lesions appear to differ in no essential particular from those found in any other form of syphilis, and therefore this fact may be taken as militating against the neurotropic theory of the disease. Support of the defective durability theory is gained by consideration of the family history of general paralytics in respect of hereditary mental weakness, by the death incidence tables of Bolton, and by instances of several members of the same family infected by different persons all developing the same type of parenchymatous neuro-syphilis. If not for this theory, at any rate against the neurotropic school, is the comparative rarity of conjugal general paralysis and tabes.

The evidence concerning syphilis in China and Persia, the examples of dementia paralytica and tabes contracted by different persons from the one source, and the bacteriological evidence, such as it is, favour the neurotropic school. We are of the opinion that the weight of the evidence is in favour of the defective durability hypothesis, whether or not a neurotropic strain of spirochæte exists.

There only remains the pleasant duty of offering our sincere thanks to Dr. E. F. Reeve and the staff of Rainhill Mental Hospital for their enthusiastic support and for their great kindness in collecting a large number of samples under the most difficult and trying conditions. Our thanks are also due to Prof. Ernest Glynn, of Liverpool University, who has given us constant helpful advice and encouragement during this work.

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BLOOD-PLATE COUNTS IN PULMONARY TUBERCULOSIS.

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The relation of blood-plates to microbial infection has been made apparent from a number of different aspects. Bull[1] has shown that the injection of certain bacteria into the circulation of animals is followed by their agglutination and disappearance, and Delrez and Govaerts[2] found that this agglutination is occasioned by the blood-plates. That a diminution of the number of plates is associated with a lowering of the resistance to infection has been proved by Cramer, Drew, and Mottram,[3] who found that thrombopenia could be induced by vitamin-A starvation or appropriate exposure to radium or X radiation, and was associated with a tendency to the development of infective conditions. In the human subject the writer has observed a thrombopenia during acute infection. The following record shows that in pulmonary tuberculosis—a chronic disease—the blood-plate picture is very different, the tendency being to a thrombocytosis.

Technique.

The method described in a previous paper[4] has been greatly improved and simplified as a result of suggestions made by Dr. L. Colebrook. The finger is pricked through a droplet of the diluent with the ragged end of a teated glass pipette whose interior is lined with paraffin: the blood-diluent mixture is then emptied on to a paraffined slide where it is thoroughly mixed by being sucked to and fro by the pipette, and if necessary further diluted: a suitable quantity of a suitable dilution is then placed on a slide, covered, and sealed. In order to conserve a uniform relative distribution of plates and red corpuscles it is essential to carry out the manipulations with rapidity.

Sixty-five cases of pulmonary tuberculosis have been examined in this way; these were unselected but have been rearranged in the table in categories according to the number of plates found; it is believed that the experimental error does not exceed 10 per cent., and in many cases the figure given is the mean of two or more counts. In a series of normal subjects the plate count was found to vary from 250,000 to 380,000 per c.mm., the average being 300,000. All the observations were made at an altitude of 5000 feet, where the normal red corpuscle count is in the region of 6,500,000 per c.mm. The clinical remarks do not aim at any degree of completeness, but are rather intended to give some impression of the cases from a general point of view, with special reference to prognosis: the temperatures (T.) mentioned are Fahrenheit and rectal. G.C. refers to the general condition as evidenced by weight, exercise tolerance, and appetite. Treatment by artificial pneumothorax is denoted by A.P.

Discussion.

It is apparent that the blood-plates are generally present in excessive numbers in active pulmonary tuberculosis, and that, broadly speaking, the more serious the clinical condition the greater is the degree of thrombocytosis. All the fatal cases in the series are to be found in Category III. In some cases, where repeated counts have been made at intervals, a change in the number of plates has occurred—e.g., Nos. 35, 38, 60, 65. When this change is in the direction of the normal, it has coincided with an improvement in the clinical condition, whereas a movement in the opposite direction, or the persistence of a high plate count, has been associated with progression of the disease. On the other hand, the maintenance of a normal plate count points to stability. More prolonged observation is required to determine the more precise relations between thrombocytosis and the stage of the disease, but it is already apparent that there is no necessary correspondence between the number of plates and such features as pyrexia, the anatomical extent of the

It is interesting to compare these figures with those obtained in similar institutions in America. Fell,[12] working in the Elgin State Hospital, found a positive Wassermann reaction in 15·7 per cent. of 1266 consecutive admissions. Excluding the syphilitic psychoses the figure obtained by him dropped to 4·8 per cent. Lowrey[13] examined 1600 unselected admissions to Danvers State Hospital, and found that 16 per cent. gave a definitely positive and 3·8 per cent. a doubtfully positive Wassermann reaction. Of Holbrook's[14] 1153 white patients in the East Louisiana Hospital for the Insane only 6 per cent. of the bloods reacted positively, while amongst 447 negroes a figure of 9 per cent. was registered. Flashman and Latham[15] have studied the same problem amongst idiots and imbeciles. At Newcastle Hospital they obtained 9·8 per cent. of positive reactions (436 cases examined). Interesting quotations are to be found in this paper dealing with similar cases in other areas. (Table X.)

Table X.

	Cases.	Per cent.
Robiart and others	246	30·8
Kellner and others	216	7·4
Liepmann	78	9·0
Dean	330	15·4
Dalldorf Asylum	—	13·2

It is to be regretted that, with the exception of Fell, these authors do not draw a distinction between the paralytic and non-paralytic elements of the asylum population. In Fell's work the figure (4·8 per cent.) for Elgin State Hospital (general paralytics excluded) is distinctly below the average. At Rainhill Mental Hospital we obtained a figure of 11·7 per cent. At first sight, if the "defective durability" theory be true, one would expect to find the incidence of syphilis in mental hospitals, when the general paralytics are excluded, to be practically nil, except for comparatively recent infections in young subjects; for every individual who is a potential lunatic should, if he contracted syphilis, become a general paralytic. Further consideration of this question, however, must lead to the view that it is not every potential lunatic who is likely to develop general paralysis, but only one whose mental weakness takes the form of a tendency to dementia—such a person has been called by Bolton[1] a "dementable psychopath." Should a person belonging to this group of dementable psychopaths acquire syphilis he should develop general paralysis. Therefore, the incidence of syphilis among cases of dementia, other than dementia paralytica, in any asylum should be much lower than that among other asylum inmates or in the general community.

In order to test this hypothesis we examined the blood with regard to the Wassermann reaction in 198 cases of secondary dementia at the Lancashire County Mental Hospital, Rainhill. Of these 198 cases seven gave a positive reaction, a percentage of 3·5; this figure is low as compared with that for the general asylum population (11·9) and gives support to this theory.

Facts Collected from the Literature.

The last section of this paper deals with facts germane to the subject which have been collected from the literature, but have not, as yet, been confirmed by us. Bolton[1] has published very careful work on this subject. He states that—

> "The ordinary sane individual and the ordinary psychopath or potential lunatic who possesses cortical neurones of average durability may suffer from syphilis with impunity as regards the onset of dementia paralytica; and I should express the same opinion with regard to syphilised lunatics with little or no dementia, who are fairly common in asylums. On the other hand, I think that a psychopath, who possesses cortical neurones of subnormal durability, and who apart from an attack of syphilis would develop a moderate grade of dementia, . . . would on acquiring this disease be liable sooner or later to suffer from one or other of the types of dementia paralytica."

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> "Of the cases 13 were private and 72 rate-paid patients. In eight of the 13 private cases there was direct or collateral insanity; in three more there were allied disorders, including epilepsy; in the twelfth the father died of cerebral hæmorrhage and the mother of paralysis . . .; and in the thirteenth the mother and sister died of phthisis, a brother was delicate, and 11 out of 14 in the family were dead. . . . Of the 72 histories of rate-paid patients, there was psychopathic heredity in no less than 81·9 per cent., and an abnormally high family death-rate in another 9·7 per cent."

These findings certainly appear to lend support to the defective neuronic durability theory.

On the other hand, evidence in favour of the neurotropic theory is gathered from a consideration of statistics of neuro-syphilis incidence among certain races. Lennox[16] showed that in China syphilis is three times more common than in America, whereas the incidence of neuro-syphilis is extremely rare; and, moreover, that those cases which do show signs of neuro-syphilis are usually sailors who have been infected from European sources. In our series of cases there were 13 Chinamen, eight of whom were general paralytics. Christidi[17] has shown that among 3000 cases of syphilis in Persia general paralysis was not found once, although the Persians are intellectual workers and use alcohol and opium. Further, Europeans infected by Persians show the same immunity to neuro-syphilis; but of 22 Europeans infected by non-Persian women two developed general paralysis.

Against this should be placed the figures derived from a study of conjugal general paralysis and tabes. Drysdale[18] analysed the literature up to the year 1916 in this respect, and was only able to collect 44 published cases where man and wife were both infected with parenchymatous neuro-syphilis. So far as we could gather two such instances occurred in our series.

Another argument against the neurotropic theory is the fact that general paralysis is relatively uncommon in women. If there were a neurotropic strain of spirochæte one would expect a larger number of female cases, since it may be assumed that probably every syphilitic man runs the risk of infecting at least one woman. The same argument is applicable in the case of the children of general paralytics in whom congenital somatic syphilis is very common and yet neuro-syphilis is rare. It should be mentioned, however, that in the records of a series of juvenile paretics numbering 12, one of the parents died of general paralysis in two instances (Watson[20]).

It is difficult to understand how a special neurotropic variety of spirochæte, having its only habitat in the nervous system, can enter another host. But that this is not necessarily true is suggested by the work of Moore and Kemp,[19] who state:—

> "Although the danger of infection for the spouse increases as the date of infection of the one acquiring syphilis approaches the year of marriage, it is shown that neurosyphilitic patients may be infectious for many years in spite of the absence of demonstrable open lesions."

Many classical examples are found in the literature of instances of one woman infecting many men in all of whom a similar parenchymatous neuro-syphilis has resulted. These observations provide one of the most important planks in the platform of the neurotropic school. On the other hand, just as many, or more, instances are found in the literature where several members of the same family, infected at widely different times by different women in different countries, have all developed the same variety of parenchymatous neuro-syphilis. These observations favour the defective durability hypothesis, since such a weakness would naturally occur in several members of the same family. Finally, in this connexion we can find no evidence in support of Mott's contention that social class or type of work play a part in the causation of parenchymatous neuro-syphilis.

The results obtained by bacteriologists, which ought to have been the most weighty of all, are, unfortunately, most indefinite. Ever since Noguchi, about 1912, first cultivated the *S. pallidum* many attempts have been made to differentiate strains of the organism depending upon morphological and cultural characteristics and behaviour on inoculation. Some evidence has resulted suggesting that dermotropic and neurotropic strains of the virus exist, but many difficulties have been encountered.

In conclusion, ample evidence of the presence of somatic lesions in general paralysis has been given. These lesions appear to differ in no essential particular from those found in any other form of syphilis, and therefore this fact may be taken as militating against the neurotropic theory of the disease. Support of the defective durability theory is gained by consideration of the family history of general paralytics in respect of hereditary mental weakness, by the death incidence tables of Bolton, and by instances of several members of the same family infected by different persons all developing the same type of parenchymatous neuro-syphilis. If not for this theory, at any rate against the neurotropic school, is the comparative rarity of conjugal general paralysis and tabes.

The evidence concerning syphilis in China and Persia, the examples of dementia paralytica and tabes contracted by different persons from the one source, and the bacteriological evidence, such as it is, favour the neurotropic school. We are of the opinion that the weight of the evidence is in favour of the defective durability hypothesis, whether or not a neurotropic strain of spirochæte exists.

There only remains the pleasant duty of offering our sincere thanks to Dr. E. F. Reeve and the staff of Rainhill Mental Hospital for their enthusiastic support and for their great kindness in collecting a large number of samples under the most difficult and trying conditions. Our thanks are also due to Prof. Ernest Glynn, of Liverpool University, who has given us constant helpful advice and encouragement during this work.

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LATE SENIOR ASSISTANT MEDICAL OFFICER, ENGLISH SANATORIUM, MONTANA, SWITZERLAND.

THE relation of blood-plates to microbial infection has been made apparent from a number of different aspects. Bull[1] has shown that the injection of certain bacteria into the circulation of animals is followed by their agglutination and disappearance, and Delrez and Govaerts[2] found that this agglutination is occasioned by the blood-plates. That a diminution of the number of plates is associated with a lowering of the resistance to infection has been proved by Cramer, Drew, and Mottram,[3] who found that thrombopenia could be induced by vitamin-A starvation or appropriate exposure to radium or X radiation, and was associated with a tendency to the development of infective conditions. In the human subject the writer has observed a thrombopenia during acute infection. The following record shows that in pulmonary tuberculosis—a chronic disease—the blood-plate picture is very different, the tendency being to a thrombocytosis.

Technique.

The method described in a previous paper[4] has been greatly improved and simplified as a result of suggestions made by Dr. L. Colebrook. The finger is pricked through a droplet of the diluent with the ragged end of a teated glass pipette whose interior is lined with paraffin: the blood-diluent mixture is then emptied on to a paraffined slide where it is thoroughly mixed by being sucked to and fro by the pipette, and if necessary further diluted: a suitable quantity of a suitable dilution is then placed on a slide, covered, and sealed. In order to conserve a uniform relative distribution of plates and red corpuscles it is essential to carry out the manipulations with rapidity.

Sixty-five cases of pulmonary tuberculosis have been examined in this way; these were unselected but have been rearranged in the table in categories according to the number of plates found; it is believed that the experimental error does not exceed 10 per cent., and in many cases the figure given is the mean of two or more counts. In a series of normal subjects the plate count was found to vary from 250,000 to 380,000 per c.mm., the average being 300,000. All the observations were made at an altitude of 5000 feet, where the normal red corpuscle count is in the region of 6,500,000 per c.mm. The clinical remarks do not aim at any degree of completeness, but are rather intended to give some impression of the cases from a general point of view, with special reference to prognosis: the temperatures (T.) mentioned are Fahrenheit and rectal. G.C. refers to the general condition as evidenced by weight, exercise tolerance, and appetite. Treatment by artificial pneumothorax is denoted by A.P.

Discussion.

It is apparent that the blood-plates are generally present in excessive numbers in active pulmonary tuberculosis, and that, broadly speaking, the more serious the clinical condition the greater is the degree of thrombocytosis. All the fatal cases in the series are to be found in Category III. In some cases, where repeated counts have been made at intervals, a change in the number of plates has occurred—e.g., Nos. 35, 38, 60, 65. When this change is in the direction of the normal, it has coincided with an improvement in the clinical condition, whereas a movement in the opposite direction, or the persistence of a high plate count, has been associated with progression of the disease. On the other hand, the maintenance of a normal plate count points to stability. More prolonged observation is required to determine the more precise relations between thrombocytosis and the stage of the disease, but it is already apparent that there is no necessary correspondence between the number of plates and such features as pyrexia, the anatomical extent of the

It is interesting to compare these figures with those obtained in similar institutions in America. Fell,[12] working in the Elgin State Hospital, found a positive Wassermann reaction in 15·7 per cent. of 1266 consecutive admissions. Excluding the syphilitic psychoses the figure obtained by him dropped to 4·8 per cent. Lowrey[13] examined 1600 unselected admissions to Danvers State Hospital, and found that 16 per cent. gave a definitely positive and 3·8 per cent. a doubtfully positive Wassermann reaction. Of Holbrook's[14] 1153 white patients in the East Louisiana Hospital for the Insane only 6 per cent. of the bloods reacted positively, while amongst 447 negroes a figure of 9 per cent. was registered. Flashman and Latham[15] have studied the same problem amongst idiots and imbeciles. At Newcastle Hospital they obtained 9·8 per cent. of positive reactions (436 cases examined). Interesting quotations are to be found in this paper dealing with similar cases in other areas. (Table X.)

TABLE X.

	Cases.	Per cent.
Robiart and others	246	30·8
Kellner and others	216	7·4
Liepmann	78	9·0
Dean	330	15·4
Dalldorf Asylum	—	13·2

It is to be regretted that, with the exception of Fell, these authors do not draw a distinction between the paralytic and non-paralytic elements of the asylum population. In Fell's work the figure (4·8 per cent.) for Elgin State Hospital (general paralytics excluded) is distinctly below the average. At Rainhill Mental Hospital we obtained a figure of 11·7 per cent. At first sight, if the "defective durability" theory be true, one would expect to find the incidence of syphilis in mental hospitals, when the general paralytics are excluded, to be practically nil, except for comparatively recent infections in young subjects; for every individual who is a potential lunatic should, if he contracted syphilis, become a general paralytic. Further consideration of this question, however, must lead to the view that it is not every potential lunatic who is likely to develop general paralysis, but only one whose mental weakness takes the form of a tendency to dementia—such a person has been called by Bolton[1] a "dementable psychopath." Should a person belonging to this group of dementable psychopaths acquire syphilis he should develop general paralysis. Therefore, the incidence of syphilis among cases of dementia, other than dementia paralytica, in any asylum should be much lower than that among other asylum inmates or in the general community.

In order to test this hypothesis we examined the blood with regard to the Wassermann reaction in 198 cases of secondary dementia at the Lancashire County Mental Hospital, Rainhill. Of these 198 cases seven gave a positive reaction, a percentage of 3·5; this figure is low as compared with that for the general asylum population (11·9) and gives support to this theory.

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It is apparent that the blood-plates are generally present in excessive numbers in active pulmonary tuberculosis, and that, broadly speaking, the more serious the clinical condition the greater is the degree of thrombocytosis. All the fatal cases in the series are to be found in Category III. In some cases, where repeated counts have been made at intervals, a change in the number of plates has occurred—e.g., Nos. 35, 38, 60, 65. When this change is in the direction of the normal, it has coincided with an improvement in the clinical condition, whereas a movement in the opposite direction, or the persistence of a high plate count, has been associated with progression of the disease. On the other hand, the maintenance of a normal plate count points to stability. More prolonged observation is required to determine the more precise relations between thrombocytosis and the stage of the disease, but it is already apparent that there is no necessary correspondence between the number of plates and such features as pyrexia, the anatomical extent of the

a gradual fall in the leucocytes to normal, following weekly doses of X rays over a period of about three months. It has been shown that in healthy people small doses of X rays give rise to an increase in the platelet count (Degkwitz), the red and white cells being little affected. Larger doses, however, lead to a destruction of the platelet; in fact, Fabricius Möller[12] was able to produce typical purpura hæmorrhagica, with a marked fall in the platelet count, by exposing guinea-pigs to X rays.

P.C.g.l. = Percentage of granular leucocytes.
P.C.n.-g.l. = Percentage of non-granular leucocytes.

Age.	Disease.	Red cells.	Platelets.	White cells.	P.C. g.l.	P.C. n.-g.l.
		Reckoned in thousands.				
29	Normal	5500	275	—	—	—
28		5200	371	—	—	—
18		5000	417	—	—	—
45		6000	375	—	—	—
43	Myelogenic leukæmia	3422	342	23	90	10
50	Ditto (aleukæmic stage)	5144	643	13½	94	6
64	Ditto (typical case)	3912	978	137	98	2
42	Myelogenic leukæmia	4000	446	26	89	11
25	Ditto (typical case)	1830	704	75	92	8
9	Ditto (typical case)	2784	1397	384	99	1
9	Progressive doses of X rays	2816	1126	156	99	1
		3136	784	88	96	4
		5184	518	7½	77	23
29	Hæmolytic icterus (before splenectomy)	4100	455	9½	73	27
29	Ditto (after)	4228	1123	20	67	33
37	Lymphadenoma	5100	300	7½	66	34
9		3126	1042	12	76	24
8		3260	435	8	80	20
10		5000	625	11	83	17
2½	Broncho-pneumonia	4140	548	24	78	22
13/12		4800	640	30	66	34
2		4756	375	14	69	31
1	Ditto (purpuric spots on arms and legs. Very ill.)	4876	812	25	65	35
11/12	Broncho-pneumonia	4448	148	10	57	43
56	Pernicious anæmia	2268	162	4½	64	36
57		1530	51	3½	58	42
46		2124	106	4	76	24
35		1000	28	6	52	48
18	Lymphatic leukæmia (purpuric symptoms)	2550	16	8	14	86
5	Acute purpura	2605	26	14	80	20
29	Secondary anæmia	928	293	5	70	30
46		1664	308	4	68	32
2		4400	400	23	56	44
12/52	Ditto (recurrent hæmatemesis and melæna)	5500	700	15	21	79
1/12	Cellulitis of groin	4280	428	16½	45	55
3	Congenital pulmonary stenosis	6576	328	9½	58	42
19/12	? Von Jacksch's anæmia. (Small petechial hæmorrhages on arms and legs.)	3888	20	16	54	46

Most of the cases of broncho-pneumonia showed an increase of platelets, though one case showed a definite fall. Other observers have found a preliminary fall during the onset of acute disease, followed by a rise during convalescence. Hæmorrhagic spots simulating purpura were present on the legs and abdomen of one case of broncho-pneumonia, with a platelet count of 812,000. This child was dangerously ill, and apparently suffering from severe septicæmia, so that the hæmorrhagic foci were probably due to septic thrombi in the capillaries. These findings correspond very closely with those obtained by previous workers, though Buckman and Habiser report one case of lymphatic leukæmia with normal platelet count and bleeding time. Generally speaking, an increase of platelets is associated with an active proliferation of bone marrow, a diminution of these elements being associated with bone-marrow failure. The marked increase of platelets after splenectomy, which has also been shown experimentally by Bedson (findings as yet unpublished), indicates that the spleen is concerned with their destruction, and negatives the theory that they are formed by the reticulo-endothelial system.

The increase of platelets in lymphadenoma is of interest in connexion with the proliferation of lymphadenoma giant cells. Two of these cases were examined post mortem, and sections of the bone marrow (femur) showed proliferation of megalocaryocytes. In one case especially, which had a platelet count of over a million, numerous young megalocaryocytes were present. In many cases these were difficult to distinguish from giant lymphadenoma cells, both presenting clear vesicular lobed nuclei with well-marked nucleoli, and irregular, badly defined, pale-staining cytoplasm. The bone marrow from several cases of broncho-pneumonia in young children was also examined and showed numerous megalocaryocytes, some young forms being present, which again presented a striking resemblance to the lymphadenoma cell. As the megalocaryocyte gets older, it grows much larger, the nucleus becomes multi-lobed, stains more darkly, is less vesicular, and does not show nucleoli so distinctly; in the terminal stages pyknotic forms are seen. Such changes have not been met with in the lymphadenoma cell.

Correlation with Coagulation.

In nearly all of the above cases of blood diseases the bleeding time and coagulation time were tested. The bleeding time was estimated by the method described by Duke[1] (loc. cit.). A standard wound was made in the lobe of the ear with puncturing apparatus (B 2216), as supplied by Baird and Tatlock, and each drop of blood, as it exuded, absorbed with filter-paper at intervals of about 15 seconds, avoiding touching the ear, until the bleeding stopped. Normally the bleeding time varies from 2 to 3½ minutes. Coagulation time was estimated by Rodda's[13] method, which, though a rough bedside test, gives more consistent results than any of the coagulometer methods. A drop of blood is taken direct into a clean watch-glass, a grain of No. 6 shot added, and then covered with another watch-glass to prevent evaporation. The glass is now turned from side to side through an angle of 90°, so that the drop of blood runs out into a streak about three-quarters of an inch long. The glass is gently rocked from side to side at intervals of half a minute, the grain of shot rolling to and fro in the drop of blood until coagulation occurs, when it is held by the clot. Normal coagulation time with this method varies from 5 to 10 minutes. In each case a control should be done.

In all the cases tested no direct correlation could be found between the platelet count, bleeding time, and coagulation time. The bleeding time was, however, usually prolonged when the platelets were markedly diminished. The coagulation time appeared to be quite independent of the number of platelets and would seem a very unreliable guide, with regard to tendency to hæmorrhage, apart from cases of hæmophilia, in which the bleeding time and platelets are stated to be approximately normal while the coagulation time is definitely prolonged.

Conclusions.

(1) A considerable diminution in the platelet count was found in pernicious anæmia, lymphatic leukæmia, and purpura hæmorrhagica, whereas an increase in these elements of the blood was noted in lymphadenoma and myelogenous leukæmia.

(2) In those cases of secondary anæmia examined, normal or slightly increased counts were obtained.

(3) Generally speaking, an increase of platelets would seem to be associated with a hyperactivity of the bone marrow and vice versa, suggesting that the platelet originates in this portion of the hæmopoietic system.

(4) In one case examined, splenectomy resulted in a very considerable increase in the platelet count.

(5) An increased bleeding time is associated with a low platelet count.

(6) No correlation could be made out between bleeding time and coagulation time.

I have to thank Dr. S. P. Bedson for his valuable suggestions and criticisms in connexion with this work, and also the visiting staff of the Royal Victoria Infirmary, Newcastle-on-Tyne, and of the East London Hospital, Shadwell, for free access to the cases under their charge.

(Continued at foot of next page.)

HOP DERMATITIS.

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ALTHOUGH the annual migration of large numbers of the poor of the East End has long been an established factor in the social life of these workers, and although hopping annually for a fortnight to a month makes breaches in the attendances of out-patients in every department of the London Hospital, dermatitis due to hops has not hitherto been noted in the skin department. Several reasons may be advanced for this, particularly the fact that hopping is regarded as a holiday and never as a serious occupation, and also because there is reason to believe that the condition itself is rare and that the factors favourable for its development are not always present. The condition itself is so severe that patients of years of discretion who find that they cannot go among the hops are more likely to avoid exposure entirely rather than, by suffering repeated attacks, to bring this condition to the notice of our profession.

Literature.

Dermatological literature is singularly unhelpful. Macleod[1] states that "about a hundred plants have actually been found capable of setting up dermatitis and their number is gradually increasing, especially from abroad," but in this connexion the English hop is not mentioned. Prosser White,[2] merely includes "Nat. Order Cannabinaceæ, Hops when picked," among causes of plant dermatitis. Dale,[3] in his "Pharmacologia," referring to the external application of hops, says only, De Lupulo Salictario—"Extrinsicus sedebat dolores." This attribute of 1693 is to be found again in 1916 in Squire's[4] "Companion to the Pharmacopœia," which says that hops may be used topically as fomentation or poultice in painful inflammations and swellings. The latest Codex[5] mentions that the hop strobiles contain an essential oil called humulene that is a sesquiterpene. Danlos,[6] whose case (1900) I quote, later makes mention of a barren search of the literature for a similar case. In the 1923 edition of Bernhard Smith's "Poisonous Plants of All Countries," humulus lupulus is not mentioned. Dr. John Badham,[7] writing from Worksop, Notts, in October, 1834, describes fully the case of a girl, Mary Bell, aged 14. He gives a reason for his writing "as I have not been able to find a case of the kind recorded by any authors, English or foreign." His patient attributed her symptoms to immersing her hands, then suffering with chilblains, in a hop-bin to warm them. Shortly after this she began to feel a smarting or tingling in the hands as if she had been stung by nettles. In a few hours a distinct cuticular efflorescence appeared accompanied by a *strong disposition to sleep;* vision was impaired and she fell into profound slumber. The morning after her face was covered with a deep erythema, her eyelids were closed by tumefaction, by the evening the hands and face were covered with vesicles, and in four more days the patient was desquamating and convalescing. "The interest of this case appears to consist, first in its appearing to prove the physiological fact of cutaneous absorption; and second because it discovers a new and hitherto unsuspected acrid principle in the hop."

FIG. 1 (CASE 1).

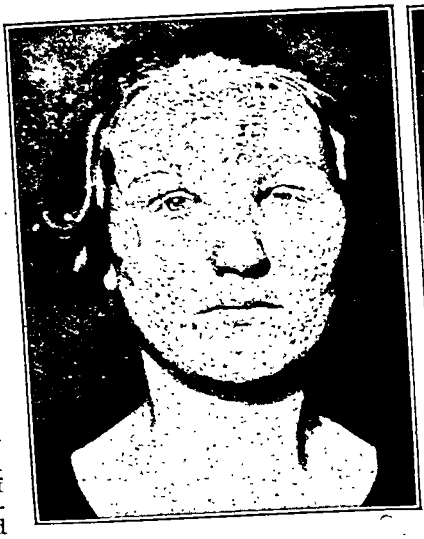
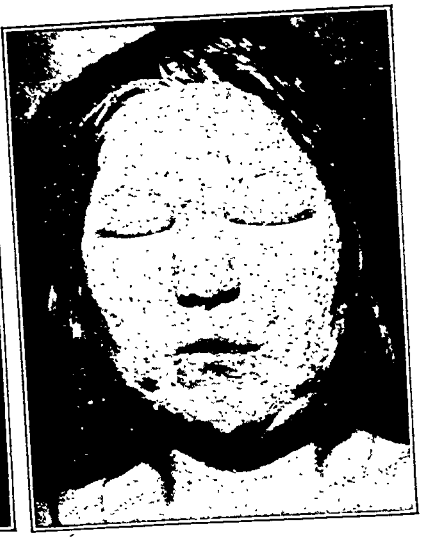


FIG. 2 (CASE 2).



Two cases of hop dermatitis, both occurring in the same patient for the second time.

Danlos's reference[6] to the condition is as follows:—

Eczéma artificiel provoqué par le houblon.—Il s'agit d'une femme de 67 ans, entrée à l'hôpital avec un eczéma typique de la figure (gonflement des paupières et des joues, vésiculation abondante) et de la face dorsale des mains (vésicules groupées, sous-épidermiques, confluentes); la malade nous dit que les accidents se produisent chez elle pour la seconde fois dans les mêmes circonstances. Il y a cinq ans, c'est après avoir été occupée pendant un mois à tirer du houblon qu'elle a vu se développer l'éruption. Cette fois, c'est après deux jours seulement de travail que le mal est apparu. "Cinq autres femmes, employées au même travail, avaient présenté de semblables accidents."

Sabouraud and other distinguished French dermatologists concurred in the writer's diagnosis of his case.

Case Records.

The following two cases were recently admitted as out-patients to the London Hospital.

CASE 1.—E. B., aged 20, a usually healthy blonde, first went hopping when a girl of 12 and was laid up then with erysipelas of the face. For the second time in her life she, this year, again went hopping in Kent, and her face itched as soon as she entered the hop-field. She gave up at the end of the day and appeared at the skin clinic of the London Hospital on Sept. 4th, 1924, with an eruption of four days' standing which had been diagnosed as erythema solare! Her face was red and swollen, the eyelids were markedly distended with œdema, and the affected skin was covered with small, often broken, vesicles. There was no adenitis, no conjunctival congestion, no pityriasis capitis, no focus of purulent inflammation, and no fever. She complained only of the deformity, the itching, and the tightness of the skin of her face. When seen again in five days she was almost well. (Fig. 1.)

CASE 2.—A. B., aged 16, was also a blonde. She remembered no recent illness and appeared at Dr. J. H. Sequeira's clinic on the same morning as the previous case, being sent to us as a case of urticaria. She had travelled to visit

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(*Continued from previous page.*)

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relations in the hop-fields on Monday; on Tuesday her "forehead broke out in pimples," on Wednesday her whole face was swollen, and on Thursday, Sept. 4th, 1924, she was led to the hospital by her mother, unable to see. The patient's face was red and very swollen, the surface papular and moist, her eyes were occluded by œdema of the lids. on her neck were numerous small and large discrete red papules. On her forearms were several discrete red papules and many red raised linear abrasions up to four inches long, due to scratches by the hop bine. When seen again in five days all swelling was gone and the skin was clear, save for small scabs on the chin. It is noteworthy that this patient, too, when aged 12, as in the case of E. B., was brought to the hospital from the hop-fields on Sept. 28th, 1920, for what was then termed impetigo of the face and arms, and was apparently cured after two visits. (Fig. 2.)

Summary.

In a characteristic case of plant poisoning the hands, face, and genitals are covered with closely placed minute vesicles and bullæ on an erythematous base. There is often considerable tumefaction. The eruption is often mistaken for erysipelas, but its appearance in gardeners (amateurs or professional) should lead to careful inquiry as to the possibility of plant poisoning.[4] It can be seen that the cases I have described follow closely the general type-reaction as described by Sequeira. Females only, so far, have been affected, from the ages of 12 up to 67, always in the month of *September*. The eruption is severe and recurs rapidly on re-exposure. The diagnoses that have been so far suggested, before the occupational ætiology was appreciated, were impetigo, erysipelas, hydroa, and urticaria.

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THE VITAMIN-A CONTENT OF CERTAIN VEGETABLE OILS.

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THE following are notes of some experiments, carried out at the Nutrition Laboratory, Port Sunlight, on the vitamin-A content of certain oils.

I. *Arachis and Linseed Oils.*

Drummond and Coward (1920)[1] have reported that the amount of vitamin A in vegetable oils depends (*a*) upon the source from which the oil is derived, and (*b*) upon the method of preparation and refinement. They also found that linseed oil was not entirely destitute of vitamin A unless it had been reduced, in which case the vitamin was lost. The linseed oil used was cold drawn from whole seeds, and not having been subjected to any drastic methods of refinement, would consequently be expected to retain any vitamin originally present.

The usual method of preparing arachis oil is by cold drawing from dried seeds. This produces the finest quality. A second grade may be obtained by moistening and heating the residue from the former process. It is refined by allowing it to stand for some time and filtering the supernatant liquid. The latter is afterwards treated with fullers' earth and animal charcoal which bleaches it (and possibly removes some of the vitamin which may become absorbed). In the sample I used, the nuts, previous to being cold drawn, had been decorticated. and this might be expected to have a deleterious effect upon the vitamin-B content of the oil, since it is to be supposed that, as in the case of other seeds, this vitamin is localised in the pericarp. The absence of any vitamin B from the oil, however, would have been made up in the food of the animals under experiment by the addition of the marmite extract used, and consequently one would not have expected the growth of the animals to be impaired on this account. Mellanby[2] has found that arachis oil is protective against rickets, but, beyond this, there is little that can be found in the literature as regards its vitamin content.

Technique.

The technique of the experiments was as described previously (Stammers, 1921),[3] eight animals being used for each experiment and eight as controls, fed on basal diet plus butter fat. The experiments were carried out under winter conditions, so that the growth from butter fat was not as good as otherwise might be expected. They were continued for 101 days. At the commencement the average weights were as follows :—

Linseed oil animals	53 g.
Arachis „ „	54 g.
Butter fat (controls)..	57 g.

and at the conclusion :

Linseed oil animals	74 g.
Arachis „ „	61 g.
Controls	146 g.

The gain in weight over this experimental period, therefore, was :

Linseed oil animals	21 g.
Arachis „ „	7 g.
Controls	89 g.

Four of the linseed oil and three of the arachis oil animals died before the twenty-eighth day of the experiment, after exhibiting symptoms of some infection of the urogenital tract[4] and considerable distension of the abdomen. The latter, on post-mortem examination, proved to be due to the intestines being inflated with gas. These animals must, therefore, be left out of account, as their deaths were not, in all probability, due to any deficiency of vitamins in the diet. In this connexion, it is noteworthy that five of the butter fat controls also succumbed before the thirtieth day, apparently from the same cause as the others, as their symptoms were identical. Consequently, after this period, the growth is judged upon four linseed oil animals, five arachis oil, and three butter fat, and the results must therefore be considered in the light of this. Of the remaining animals, two of those fed on linseed oil died on the ninety-fifth day, and there remained two survivors after the termination of the experiment, which, although apparently in very poor condition, had not developed ophthalmia.

Of those fed on arachis oil, three died (on the fifty-seventh, sixty-fourth, and seventy-first days) before the conclusion of the experiment, thus leaving two survivors, both of which exhibited marked signs of ophthalmia. The three controls on butter fat remained in good condition, although their growth was subnormal.

Summary and Conclusions.

The survivors from the linseed oil experiment, although in very poor condition, did not develop ophthalmia, while those from arachis oil did, in a marked degree. This may be due to individual predisposing causes. It is difficult, however, to reconcile this with Mellanby's finding that arachis oil is protective against rickets.

It is concluded that neither of these oils, prepared in the way described, which would probably be the best possible as regards preserving the original vitamin-A content, is of any value as a source of this vitamin.

II. *Maize Oil.*

Two experiments on this product are described. The sample used in the first of these had been in the laboratory for some months and was rancid; it was therefore expected that the vitamin content might have become impaired through oxidation.

The experiment was commenced on Nov. 19th, 1920, and was carried on for 101 days, eight animals (rats) being used with eight controls and the ordinary technique of feeding, weighing, &c., being employed (Stammers, 1921).[3] At the commencement the animals averaged 54 g. in weight, which is about 18 g. above the normal for their ages, and they maintained a superiority to the normal for over three weeks. At the end of the experimental period the average weight was 128·5 g. Three animals died during the course of the experiment, but of these two were due to some unascertained cause and took place before the twenty-fourth day of the experiment. The survivors maintained an excellent state of health up to the end of the experiment, and the growth observed, although showing a considerable falling-off from the normal, yet bears very favourable comparison with that obtained from butter prepared during the winter. As an example of this the following table may be interesting.

The control fat used in this experiment was steam-distilled palm kernel oil (Stammers, 1921)[5] and the animals used as controls averaged 56 g. in weight at the beginning and 53 g. at the end, the maximum average attained being 76 g.

Experimental fat.	Date begins.	Date ends.	No. of days.	Total gain in weight.
Butterfat	12/10/20	21/1/21	101	88 g.
,, ,,	19/10/20	28/1/21	101	75 g.
,, ,,	2/11/20	11/2/21	101	85 g.
Maize oil.	19/11/20	28/2/21	101	75 g.

The second experiment was commenced on April 19th, 1921, and was terminated after 59 days. A sample of fresh maize oil was used which had been refined so that it was tasteless and almost odourless. The oil was pale amber in colour as compared with that used in the first experiment, which was very dark.

The same number of animals both for control and experiment was used as before, and the average weight of both experimental and control animals was 48 g. Steam-distilled palm kernel oil was again used as the control fat. At the conclusion of the experiment the average weight of the experimental animals was 148 g., and of the controls 88 g. The rats were slightly heavier than the normal at the commencement, and they maintained a superiority throughout, although it was somewhat diminished towards the end. During the experiment the animals appeared to be in excellent health and there was no mortality, except among the controls, three of which died after exhibiting symptoms of ophthalmia and general ill-health.

Summary and Conclusions.

Experiments with two samples of maize oil, one crude and rancid and one refined, indicate that the vitamin-A content is high. It compares very favourably with palm oil and with winter butter fat. During the second experiment a concurrent test upon cod-liver oil was being carried on, and the growth from this sample of maize oil showed some superiority to that obtained from the fish oil (Stammers, 1922).[6]

I am indebted to Messrs. Lever Bros., Ltd., for permission to publish these researches.

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THE KAHN TEST IN GENERAL PARALYSIS.

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Some months ago my attention was attracted by the Kahn agglutino-precipitation test for syphilis.[1] This test is of very simple technique and has given reliable results in the hands of American workers, Kolmer,[2] Herrold,[3] Grant,[4] and others. Keim and Wile,[5] after comparing this test with the Wassermann in a series of cases of syphilis, classified according to the stage of the disease, came to the conclusion that the Kahn test showed a greater sensitivity in the earlier stages of syphilis, but in the later stages—i.e., tertiary and parasyphilis—it did not appear so sensitive, though comparing very favourably with the Wassermann test. Anderson and Fischer[6] hold that the test has great possibilities as a direct and simple test for the serological diagnosis of syphilis, but recommend that it be more thoroughly worked out before being used as a substitute for the Wassermann.

As the test is one which might easily be carried out in any mental hospital, where it is by no means always convenient to have a Wassermann performed, it would serve to confirm the diagnosis in many a doubtful case of neurosyphilis. Recent work on the treatment of general paralysis would emphasise the importance of an early diagnosis of this condition and, when physical signs are indefinite or confusing, a simple serological test which could be performed on the spot would be of great value.

It was from this point of view that I set out to apply the test to a series of general paralytic bloods on which Wassermann tests were also done. Up to the present the series has been rather limited, chiefly owing to the fact that one phase of syphilis alone has been dealt with, but as Osmond and McClean[7] in this country have published results of the test on a series of 500 cases of general syphilis, it might be of interest to record what has been already done.

The series consisted of 93 bloods from cases of general paralysis, and the technique used was that described by Keim and Wile.[5] An analysis of the results is given here.

(1) 83 cases of G.P.I. giving a positive Wass.
Kahn + + + + 20
+ + + 26
+ + 22
+ 9
± 1
doubtful 1
− 4

(2) 5 cases of G.P.I. giving a doubtful Wass.
Kahn − 5

(3) 5 cases of G.P.I. giving a negative Wass.
Kahn + + + 2
+ + 1
+ 1
± 1

In the non-specific bloods used as controls during these tests one false positive was obtained.

Cerebro-spinal Fluid.—Though this test was intended for blood-serum only, I attempted to apply the technique to spinal fluid. Owing to the weaker precipitating capability of the spinal fluid it was necessary to use 1 c.cm. for each test instead of 0·3 c.cm. as in the serum tests; otherwise no alteration in technique was required. This larger quantity of fluid had, as might be expected, a material effect on the test. A longer incubation period was required before the reading was taken, the precipitates were not so distinct, and did not, even in most strongly positive cases, appear in clumps. Many of the precipitates were of such fine flocculation that they could scarcely be seen without the aid of a hand lens. The heavier precipitates were found to settle at the bottom of the tube, and appeared on gentle shaking as fine white flakes floating about. Twelve hours' incubation before reading was usually found to be sufficient. Up to the present the test has been carried out on 70 spinal fluids, of which 61 were from cases of G.P.I. The following are the results:—

Kahn	+	W.R.	+	48 G.P.I.
,,	−	,,	+	6
,,	+	,,	−	4
,,	doubtful	,,	−	1
,,	−	,,	−	2
,,	−	,,	−	9 non-specific cases.

Summary of Results.

Bloods.—In 93 cases of G.P.I.:

Kahn positive in 83, or 89 per cent.; doubtful in 1.
Wassermann positive in 83, or 89 per cent.; *doubtful in 5.*

Cerebro-spinal Fluid.—In 61 cases of G.P.I.:

Kahn positive in 52, or 5 per cent.; doubtful in 1.
Wassermann positive in 54, or 88 per cent.; doubtful in none.

A large majority of the above cases had received treatment of various forms, malaria, phlogetan, &c., and in some cases this was combined with specific treatment—i.e., salvarsan or tryparsamide. It is impossible to say at this stage what effect the treatment had on the test. Only one untreated case gave a negative Kahn.

The test is simple and rapid, and though it would not appear to be as sensitive as the Wassermann, it is possible that the comparison will be more favourable when a larger number of tests have been performed. It is a good confirmatory test and an excellent routine test for an institution.

I am indebted to Dr. R. M. Clark, medical superintendent, for permission to publish these results, and to Mr. A. H. Fann, chief laboratory assistant, for his valuable help.

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Reviews and Notices of Books.

PRACTICE OF MEDICINE.

Edited by FREDERICK TICE, M.D., Professor of Medicine and Clinical Medicine, and Head of the Department of Medicine, University of Illinois, College of Medicine. Ten Volumes and Desk Index, each volume about 600 pp. London: Butterworth and Co.; Hagerston, Maryland: W. F. Prior Co. 1924. £21.

POSSESSORS of this new system of medicine may, by subscribing £1 15*s.* per annum, receive sets of new pages every year, and in this manner it is hoped that the system, which is bound in leather on the loose-leaf principle, may be kept perpetually up to date. The work is entirely American, and is issued under the chief editorship of Dr. Frederick Tice, Professor of Medicine to the University of Illinois. Assisting him are Dr. Julius Friedenwald, of the University of Maryland, Dr. Julius Grinker of the Northwestern University Medical School, and Dr. Luther F. Warren, of the Long Island College Hospital, who are concerned with editing the articles dealing with gastro-enterology, neurology, and general medicine. More than 100 contributors are responsible for the text, their names including those of Walter C. Alvarez, F. H. Baetjer, Lewellys Barker, Nathan E. Brill, Thomas Richardson Brown, B. B. Crohn, Charles Lyman Greene, B. B. Vincent Lyon, C. E. de M. Sajous, and many others familiar to British readers. The first volume contains five chapters devoted to the history of medicine, after which come chapters on "hypersensitiveness," infection and immunity, focal infections, oral sepsis, the analysis of urine and cerebro-spinal fluid, and case-history taking. Following this somewhat disorderly beginning the second volume takes us to a section wherein the tests of functional efficiency of stomach, pancreas, liver, circulatory system, endocrine glands, and kidneys are discussed in detail. Thenceforward the work proceeds on more familiar lines, specific and tropical infections being completed by the middle of the fifth volume, after which diseases of the various organs are dealt with systematically. The eighth volume is devoted to diseases due to intoxications and those of the endocrine glands, whilst Vols. IX. and X. are almost wholly confined to the nervous system.

A general survey of this work leads to an impression that the general editing leaves much to be desired. The extraordinary assortment of subjects in the commencing volume is particularly open to criticism. On what grounds was it decided to lay such stress on allergy as a general factor in pathology? Why is focal infection brought into such vivid prominence, with emphasis on the work of several observers whose interesting publications still await any convincing measure of confirmation? And why is the history of medicine included in a work whose voluminous pages still find no place for diseases of the skin? These things seem to us to betray a distorted perspective which robs the work of much of the value it should possess. The inclusion of detailed descriptions of methods of studying the functional efficiency of various organs is certainly defensible, and it may be noted that the various authors have in some cases devoted considerable space to full descriptions of methods which they afterwards condemn; since their condemnation is reasoned, and full references are given with each article, this section should be of considerable value to those physicians who appreciate the value of help from the laboratories. In principle, however, it is not easy to see why chemical laboratory methods should be quoted in full when equally expert matters such as bacteriological methods are treated quite briefly. No serious attempt is made to deal systematically with the general pathogenic effects of various important organisms such as the pneumococcus, the streptococcus, or the *Bacillus coli communis*, save in a chapter on certain septicæmias. As a result the reader who desires to ascertain, for example, an author's views on infections due to Friedländer's bacillus, may find himself in difficulties. The index gives no help in this respect, nor can any reference to the subject be traced throughout the work except in a chapter on broncho-pneumonia, where it is stated that this disease is sometimes caused by Gram-negative cocci! When we say that this chapter is sandwiched between one on tuberculosis of the genito-urinary system and the one on the septicæmias already alluded to, the reader will realise that the general arrangement may waste the would-be reader's time.

The index is unworthy of the labour spent in compiling these volumes. Each of these is brought to a conclusion by a page which urges the reader to consult the special desk index which is bound separately. This index is itself introduced by a somewhat unctuous page of advice to the reader, who on seeking to make use of the vaunted volume may be gravely embarrassed. For example, no reference is given to cœliac disease; under cirrhosis of the liver we find no mention of progressive lenticular degeneration, and as that disease is described and indexed as "Wilson's disease," a reader unfamiliar with that title would have difficulty in tracing it. Another rare but well-recognised nervous disease, amaurotic family idiocy, is completely omitted from the index, though a sufficient description of it may be found on p. 198 of Vol. X. Other omissions could be cited which are inexcusable in an index which gives heavy-type references to chappara amargoso, cholamin, krameria, speidel salts, pomegranate root, papain, kamala, and other somewhat obscure nostra. The fact that under Milroy's disease this index gives no fewer than 26 references, all referring to the three pages in a single volume where that disease is dealt with, conveys a good idea of how stupidly this part of the work has been performed.

We have devoted much space to discussing the arrangement and indexing of this system of medicine because it is upon these factors that its general utility must largely depend; of that part of the text which deals with the major descriptions of the various diseases, their clinical features, diagnosis, and treatment we have far more pleasant things to say. Many of the articles are excellent. Special tribute is due to Dr. Herman O. Mosenthal for his excellent treatise on diabetes mellitus; and the thorough study of hepatic diseases by Drs. John Ferguson and W. E. Ferguson, and the chief editor's article on pericarditis are admirable. Most of the articles are followed by a bibliography, which even when incomplete is a valuable feature. If the scheme of issuing new pages yearly is carried out with thoroughness, and if proper care is given to the revision of the index, the publication of this ambitious work will have been amply justified, for a full index will meet many of the difficulties in locating information.

THE LEUCOCYTE IN HEALTH AND DISEASE.

By C. J. BOND, C.M.G., F.R.C.S., Fellow of University College, London; Hon. Consulting Surgeon to the Leicester Royal Infirmary; Member of the Cancer Committee, Ministry of Health. London: H. K. Lewis and Co., Ltd. 1924. Pp. 83. 12*s.* 6*d.*

THE author records the results of a number of experiments upon the reaction of the leucocytes to artificially induced changes in their environment. Many of these observations are of interest, as, for instance, the author's clear demonstration of the return of exuded leucocytes into the granulation tissue of a wound surface. Dr. Bond apparently believes that some change in the activity of these cells is brought about by their sojourn in the "liquor puris." On the basis of certain other experiments with incubated blood-clot he claims to be able to render the polymorphs actively phagocytic of red cells, both homologous and heterologous, and this leads him to the conclusion that substances toxic to leucocytes, when present in excess, may in higher dilutions act as opsonins. In the absence of evidence in the shape of protocols, either of experiments or controls, it is impossible to judge of the validity of these conclusions. Of many of the other observations it is difficult to understand the purpose, a difficulty which is enhanced by the author's somewhat inconsecutive and disjointed manner of presenting his facts. It is an index to the highly specialised nature of his researches that of the 33 references given 14 are to Dr. Bond's own works. The book concludes with 48 half-page microphotographs showing leucocytes, mostly in obviously indifferent health as the result of the author's attentions.

COLLECTED PAPERS.

Collected Papers, Physiological Laboratory, King's College, London. No. XXVII. Edited by W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S. 1923–1924.

THE present collection of papers will be the last to appear from the Physiological Laboratories of King's College Hospital under the editorship of Prof. Halliburton. That it need represent the editor's actual farewell to physiology there is fortunately no reason to anticipate. Of the 24 papers dealing with original research comprised in the collection, only two—one on the Appendages of the Brain, and a second short note on the Formation of a Reversible Clot by the Action of Pancreatic Juice on Milk—are from his own pen, but all bear the marks of his inspiration. The papers fall into several groups, of which the largest are those constituted by the publications of C. A. da Fano, on histological subjects, and by Dr. J. W. Pickering in collaboration with other members of the laboratory staff, on various points in connexion with the coagulation of the blood. Of Dr. da Fano's papers some deal with the Golgi apparatus of the cell, some with the histology of epidemic encephalitis with particular reference to the "minute" bodies first described by this observer, and some with the histological changes to be observed in the central and sympathetic nervous systems in the "deficiency" diseases. Dr. Pickering has brought to light many points of interest in connexion with the coagulation of the blood. Among other things he has been able to demonstrate that the anti-coagulant action of peptone on intravenous injection cannot be due, as in the view of Howell, to the production of antithrombin by the liver, for it occurs even when that organ is shut out of the circulation. He believes that neither "thrombin" nor "antithrombin" has any existence as an entity, and that coagulation of the blood depends upon the disturbance of a system formed by a protective colloid united to a fibrinogen-prothrombin complex. Dr. J. A. Hewitt, who also writes as one of Dr. Pickering's collaborators, contributes two papers dealing with the metabolism of the carbohydrates—one a destructive criticism of recent work on the relationship of the production of γ from α and β glucose to diabetes, and one on the absorption of various sugars from the gut. Dr. J. A. Shaw-Mackenzie has papers upon his serum reaction for the diagnosis of carcinoma and upon the treatment of inoperable carcinoma by the intravenous injection of sodium oleate.

BIOCHEMISTRY.

Monographs of Biochemistry. Edited by Prof. R. H. A. PLIMMER and Prof. F. G. HOPKINS. *The Simple Carbohydrates and the Glucosides.* Fourth edition. By E. FRANKLAND ARMSTRONG, D.Sc., Ph.D., F.R.S., F.I.C., Fellow of the City and Guilds of London Institute. London: Longmans, Green and Co. 1924. Pp. 293. 16*s.*

IN the past Germany has been regarded as the home of specialised scientific publications. Thus the *Biochemisches Handlexikon* and the *Physiologische Arbeitsmethoden*, edited by Prof. Abderhalden, have become world-famous as collections of articles by specialists. We should not be going too far, perhaps, to state that these German publications have only two serious rivals—namely, the *American Journal of Physiological Reviews* and the "Monographs of Biochemistry." The latter, under the general editorship of Prof. Plimmer and Prof. Hopkins, have earned a well-deserved popularity in this country, and many of the monographs have run to several editions. The volume under consideration has reached the fourth edition and has been greatly enlarged. It contains a masterly summary of the present state of knowledge on the simple carbohydrates. An account of the recent work of Irvine and his co-workers on the constitution of the polysaccharides has been included; the chapter on the relations between configuration and biological action has been rewritten, and special, but not perhaps sufficiently detailed, reference is made to insulin. A very fine bibliography is added.

We congratulate Prof. Armstrong on the new edition, and strongly recommend it to the study of biochemists.

Practical Biochemistry. Second edition. By W. A. OSBORNE and W. J. YOUNG. Melbourne: W. Ramsay. 1924. Pp. 151. 12*s.* 6*d.*

THE elementary class in practical biochemistry for medical students always presents difficulties to the teacher. In this country the class is composed of two types of men: candidates for university degrees with a certain amount of training in organic chemistry, and students for examination of the Conjoint Board by whom very little knowledge of the subject has been acquired. The former class treat the elementary biochemical tests with contempt, since they have performed the majority of them before, whilst the latter are bewildered by even the most simple organic problems. The existing English books on practical work are of very little assistance in overcoming these difficulties, since they are either too chemical or contain soul-destroying experiments with bread, butter, and milk.

The authors of the present volume are to be congratulated in that they have balanced pure and bio-chemistry very evenly, with the result that the reading and experimental matter are of interest to all types of students. The biochemical significance of all the reactions is emphasised, and futile experiments are not described. The section dealing with carbohydrates is admirable; for example, the explanation of the butylene oxide formula for glucose, as here set out, must lose its terror, even for the most elementary student. It is unfortunate that no clinical blood estimations are included, but we may expect this in the promised companion volume on advanced biochemistry.

HYGIENE AND PUBLIC HEALTH.

Fifth edition. By BIRENDRANATH GHOSH, F.R.F.P.S. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd.; Calcutta: Hilton and Co. 1924. Pp. 586. 9*s.* 6*d.*

THE fifth edition of this concisely written but comprehensive text-book will be welcomed by students of sanitation in India and the tropics. Every chapter has been carefully revised, and it has been found necessary to increase the size of the book by 79 pages. The experience of the war has altered many of our ideas on the subject of the purification of water, and the chlorination of water is now dealt with in some detail. Many of the lessons learnt during the war as to the disposal of refuse, the incineration of night-soil, and the use of improved types of latrines have also been drawn upon. In the chapter on the disposal of sewage the activated sludge process is dealt with. We note, however, that the blowing-in of air is described as a necessary feature of this new process, whereas experience in Sheffield and other places has shown that the simpler and less expensive plan of aerating the sewage by means of paddle-wheels gives equally good results. In the chapter on food, vitamins are less fully treated than is usual nowadays. Little attention is given to the use of dried milk. The opinion of most public health workers in the tropics is that dried milk especially prepared and packed for the tropics is almost an ideal way of meeting the many difficulties involved in securing a satisfactory milk-supply in hot countries.

The smoke nuisance receives little or no attention; we believe that some attempt has been made by the responsible authorities to tackle the factory smoke nuisance in Calcutta and other parts of India. The chapters on vital statistics and maternity and child welfare indicate the immensity of the problem. For example, the average infantile mortality-rate for Calcutta during recent years has been well over 300 per 1000, and about 25,000 to 30,000 mothers in Bengal die every year from causes connected with child-bearing. The chapters on the transmission of diseases by insects and on animal parasites are especially good. A useful section on village sanitation and the sanitation of fairs and religious festivals conclude the book. There are many new illustrations in this edition.

HOME SEWAGE DISPOSAL.

By W. A. HARDENBERGH, Sanitary Engineer and Director of Rural Sanitation, Jefferson County Board of Health, Alabama. London: J. B. Lippincott Company. 1924. Pp. 274. 16*s*.

THIS book fulfils its object in supplying reliable data for health officers and sanitary engineers engaged in solving sewage disposal problems for single homes, small communities, and institutions, and at the same time lays down the principles underlying such problems. The early chapters show the extent of the difficulties encountered in the U.S.A. The author estimates that only 40 per cent. of the population, practically all living in cities, are provided with sewers, and that to the remainder, numbering some 65 millions, the lessons of this book apply. He goes on to show that wherever, as the result of a survey, sanitary privies have been installed in place of unsanitary, a great reduction in the prevalence of typhoid fever has followed. The importance of a sanitary disposal of the body wastes in the prevention of diarrhœa, dysentery, and hook-worm disease (from which disease two millions of the U.S.A. population are said to be suffering) is also emphasised. Details are given of various types of closets and types of septic tank treatment which have proved satisfactory in the U.S.A. The essentials laid down for any method are that it must prevent: (1) the access of flies or animals to the excreta; (2) the scattering of excreta so as to cause soil pollution; (3) the pollution of drinking water or ground water. The English reader may be surprised to find no mention of earth closets. There is certainly difficulty in inducing a rural population to take the trouble required for the proper management of earth closets, but, when this inertia can be overcome, the earth closet, in the opinion of most medical officers of health confronted with the problem in this country, is the best solution. It may be that the prevalence of hook-worm disease renders the earth closet unsuitable for use in America.

DR. PORTEOUS.

By ARTHUR BREBNER. London: A. M. Philpot, Ltd. 1924. Pp. 260. 7*s*. 6*d*.

THIS book is a thoroughly well written account of the life of a general practitioner before the passage of the Insurance Act, and, as questions concerning the vast medical side of this legislation are always with us, and just now bid fair to be brought to the political front, it deserves close perusal for other reasons than its merits as a story. Those merits, it may be said, are high, for it is a well-written and well-observed study of the doctor's life at the end of the last and the beginning of this century. The episodes are, no doubt, arranged for purposes of composition and would not necessarily occur in the lives of many practitioners, or in the same circumstances or in the same order, but as episodes they are illustrative and often poignant.

Certain lines of quotation, placed on the title-page, explain why the hero is found at the end of the book to have deserted the calling of medicine: they are, "let every man be artist of his days, and carve into his life his own caprice." This motto dictates a transfer of Dr. Porteous's energies from general medical practice into the pursuit of art, where his career is triumphant but hardly so close to the facts of life as are his experiences as medical student, assistant, and general practitioner. Indeed, his history as an artist cannot often have been paralleled, and medical men who employ their leisure in painting need not think that their talents can usually be put to such fruitful use. Certainly Dr. Porteous conducted his art education in an effective manner, for during his career as a student he found time to sketch, to copy, to study masterpieces in galleries, to secure models among the porters at the hospital, and to cope with the theories of perspective. By chance he made some water-colour drawings to illustrate a text-book of dermatology by one of his chiefs, and as events turned out, this was a critical action in his life, for when, after many bitter experiences, failure as a medical practitioner seemed to stare him in the face a substantial cheque for these drawings arrived, and, further, the eminent dermatologist, who had been his teacher, put him into touch with an amazing art agent who gave large cheques for pictures on their merits without regard to their market value or their signatures. This gentleman saw one of Dr. Porteous's canvasses, immediately gave him £900 for it, and organised an exhibition on the opening of which the critics confirmed the great merit of the work. At which point the book ends in the distinct promise that the hero will carry all before him in the world of art and live happy and prosperous in the companionship of the devoted wife, who had supported him in his troubles.

Dr. Brebner, who died some ten years ago, had already two successful novels to his name when he wrote this posthumous work.

PICKETT-THOMSON RESEARCH LABORATORY.

Annals of the Pickett-Thomson Research Laboratory. Vol. I., No. 1., July, 1924. Issued from St. Paul's Hospital, London, W.C. Pp. 216. 25*s*.

THIS handsome volume is prefaced by photographs of Sir Ronald Ross and Mr. Pickett, and three views of the interior of the laboratory, which appears to be a very pleasant and well-equipped building. The major part of the Annals consists of three papers by Dr. David Thomson, entitled Researches on the Virus of Variola-Vaccinia, Researches on the Etiology of Measles, and Researches on the Etiology of Scarlet Fever, which occupy about nine-tenths of the volume. These articles are not reprints of papers published elsewhere, but are rather specially written essays. It should be mentioned at once that the researches chronicled are mainly those of workers outside these laboratories, which occupy some 123 pages whilst those of the author, excluding illustrations, only occupy 27 pages, a certain proportion of which is given up to discussions and conclusions. A good deal of Dr. Thomson's personal investigations are concerned with attempts to grow the viruses of the exanthemata in a large variety of media and in tissue cultures. The results in the first case are mainly negative, and in the second are uncertain and inconclusive. Thus, whilst the review of literature is sound and full, and whilst this portion of the volume may be of assistance to those anxious to obtain a résumé of current and past ideas on the subject covered, the amount of original work is relatively insignificant. The conclusions arrived at, briefly summarised, are that the Guarnieri bodies of variola are true parasites, and that as regards measles "the suspicious organisms so far which deserve further investigation are the diplococcus of Tunnicliffe, the streptococci, influenzoid bacilli, and the spirochæte of Salimbeni." The streptococcus is favourably regarded as the causal agent in scarlet fever. The papers are abundantly illustrated by some excellent photographs and coloured plates. Other minor papers bear upon the value of "detoxicated" vaccines in the complications of scarlet fever and in the tuberculin test in cattle, as well as upon experiments on the various methods of detoxication; there is also a description of certain cultural characters of organisms of the meningococcus, gonococcus, and catarrhalis groups, and the distinctive appearances of types and strains which, following Atkin, are utilised for their identification and grouping. The last paper, a clinical one in the main, contains an interesting description of cases of gas poisoning resulting from the breaking down of ammunition in the factory of F. N. Pickett et fils. This comes with something of a shock in reviving almost forgotten memories of matters which were so vividly in the forefront of our preoccupations some eight or nine years ago.

It is not easy to understand quite why the present volume has been written. If it is to be taken as a practical attempt to contribute to our knowledge of disease, as the title of the various papers suggests, it must be said that from the point of view of the laboratory worker it does not succeed in this aim.

MEDICAL INSURANCE PRACTICE.
Second edition. By R. W. HARRIS and LEONARD SHOETEN SACK. London: The Scientific Press, Ltd. 1924. Pp. 347. 7*s.* 6*d.*

A SECOND and revised edition of this useful little ook has appeared within two years of the first. It described by the authors, one of whom was formerly ssistant secretary in the Ministry of Health, and the ther is a barrister-at-law, as a work of reference to he medical benefit provisions of the National Health nsurance Acts. The revised edition incorporates the mendments effected by the Regulations of 1924, an sterisk being placed against new or amended paragraphs in order to call the reader's attention to points n which he should refresh his memory. We have already commended this book as indispensable to the practitioner who wishes to give the best service to his insurance patients with the minimum of risk and inconvenience to himself, and we do so again.

JOURNALS.

BRITISH JOURNAL OF OPHTHALMOLOGY, August, 1924.—F. A. Williamson-Noble describes an apparatus for performing a retinoscopy on a patient with undilated pupil. The apparatus is fixed, and the determination of the shadow movement is effected not by the tilting of the mirror, but by the movement by the observer of his own head.—C. H. Usher contributes a note on the Dog's Tapetum in early life. The tapetum is the structure that causes the green or yellow reflex that is apparent on illuminating the fundus of many animals. Usher by repeated examination has found that it is absent in young puppies up to about the seventh week of life, and that when it is first seen the appearance differs markedly from that seen in the adult animal.—G. F. Rochat and W. Mulder contribute a clinically important paper on Progressive Atrophy of the Iris with Formation of Holes and Glaucoma. It has generally been thought that atrophy of the iris is a condition secondary to disease of the eye, either glaucoma or cyclitis. A few cases, however, have been described in which atrophy and formation of holes in the iris have existed without any apparent cause. The authors describe a case in which the condition was well marked and in which at first the eye was otherwise normal in every respect. Some years later, however, it became blind from glaucoma. In this case, therefore, the atrophy of the iris appears to have been the primary disease.—H. J. Flieringa describes a case of uniocular paralysis of accommodation in a girl of 10 occurring after an affection of the throat which was presumably diphtheritic and clearing up in the ordinary way. A one-sided case of this sort is a rarity.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of seven boroughs during 1923:—

Name of borough.	Estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Paisley	86,027	23·5	11·5	1·2	1·3	1·3	32	66	6·5
Cambridge ..	59,130	14·8	10·5	0·9	1·6	1·5	25	48	1·1
Nuneaton ..	44·030	22·6	9·4	0·9	0·8	1·9	40	75	3·0
Colchester ..	43,002	18·6	9·7	0·8	1·3	1·4	25	42	3·6
Llanelly	38,300	23·2	10·7	1·6	0·8	1·4	31	70	1·1
Shrewsbury ..	31,600	19·8	12·7	1·0	1·3	2·9	25	62	3·2
Wrexham ..	19,420	18·8	12·9	1·4	1·4	2·2	27	79	2·7

Paisley.

Dr. G. V. T. McMichael includes in his report a drawing of the elevation, and also the plans, of the Central Medical Institute for the mothers and children of Paisley, presented to the town by Miss Russell. of Muirfield. The elevation shows a handsome building occupying a corner site. On the ground floor are the tuberculosis department and the maternity and child welfare department. On the first floor are the minor ailment clinic and the special treatment clinic for diseases of the eye, ear, nose, throat, &c., also the main office of the school medical department. On the second floor are the dental clinic, the orthopædic department, and an X ray department. The plans indicate a building excellently equipped for its purpose. Dr. McMichael, in discussing the housing problem, suggests that it will never be solved until it is lifted right out of the domain of party politics, and a national policy formulated by experts agreed on by all parties. No one, he says, can honestly be satisfied with the present environment of the working classes, especially in our large industrial towns.

Paisley has its special difficulties, as we are told in another part of the report that 69 per cent. of the houses are of one or two apartments. A very satisfactory arrangement has now been made by which all cases of small-pox in Renfrewshire are to be accommodated in the West Renfrewshire small-pox hospital. This arrangement makes the Paisley small-pox hospital permanently available as a clearing house for all cases of tuberculosis requiring institutional treatment. Dr. McMichael is well satisfied with the action of the local authority in 1922 in making all forms of pneumonia notifiable. This has enabled the department to offer hospital treatment to all the severe cases of measles and whooping-cough. A further need is convalescent home treatment for these two diseases. An unusual occurrence mentioned in the report is an outbreak of dysentery. Six members of one household were attacked, the infective organism being the Flexner (Z) bacillus. The first case, a boy of 7, died within 24 hours. At first food poisoning was suspected. The other five cases recovered. Inquiry showed that the father, an ex-Service man, had suffered from dysentery while in the army and had had recurrent attacks of diarrhœa ever since his discharge.

Antenatal work makes progress. During 1923, 404 expectant mothers attended the antenatal clinic, whilst the total births in the year numbered 2020. Dr. McMichael would like to see the Barshaw Maternity dried milk especially prepared and packed for the tropics is almost an ideal way of meeting the many difficulties involved in securing a satisfactory milk-supply in hot countries.

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PICKETT-THOMSON RESEARCH LABORATORY.

Annals of the Pickett-Thomson Research Laboratory. Vol. I., No. 1., July, 1924. Issued from St. Paul's Hospital, London, W.C. Pp. 216. 25*s*.

This handsome volume is prefaced by photographs of Sir Ronald Ross and Mr. Pickett, and three views of the interior of the laboratory, which appears to be a very pleasant and well-equipped building. The major part of the Annals consists of three papers by Dr. David Thomson, entitled Researches on the Virus of Variola-Vaccinia, Researches on the Etiology of Measles, and Researches on the Etiology of Scarlet Fever, which occupy about nine-tenths of the volume. These articles are not reprints of papers published elsewhere, but are rather specially written essays. It should be mentioned at once that the researches chronicled are mainly those of workers outside these laboratories, which occupy some 123 pages whilst those of the author, excluding illustrations, only occupy 27 pages, a certain proportion of which is given up to discussions and conclusions. A good deal of Dr. Thomson's personal investigations are concerned with attempts to grow the viruses of the exanthemata in a large variety of media and in tissue cultures. The results in the first case are mainly negative, and in the second are uncertain and inconclusive. Thus, whilst the review of literature is sound and full, and whilst this portion of the volume may be of assistance to those anxious to obtain a résumé of current and past ideas on the subject covered, the amount of original work is relatively insignificant. The conclusions arrived at, briefly summarised, are that the Guarnieri bodies of variola are true parasites, and that as regards measles "the suspicious organisms so far which deserve further investigation are the diplococcus of Tunnicliffe, the streptococci, influenzoid bacilli, and the spirochæte of Salimbeni." The streptococcus is favourably regarded as the causal agent in scarlet fever. The these tenants are paying very low rents they will require financial assistance to enable them to occupy the municipal houses. The housing committee also give sympathetic consideration in the allocation of houses to families affected by tuberculosis.

Wrexham.

Dr. T. P. Edwards took up his appointment as medical officer of health on Oct. 1st, 1923. One of the chief events of the year was the removal of the maternity and child welfare centre to new and commodious premises in Grosvenor-road. As a result of the move there has been a considerable increase in the attendances. A maternity hospital is needed, and it is hoped to obtain such by coöperation with the county. The only lying-in accommodation at present available is at the hospital of the Wrexham Board of Guardians. The health visitors' reports emphasise the urgent need for working-class houses and give numerous examples of mothers being confined in overcrowded houses. Out of 375 confinements 114 occurred in apartments. These circumstances make the need for a maternity hospital more urgent. Dr. Edwards says that the houses built at present, whether by private enterprise or under the municipal scheme, are not available for the working classes, and that what is needed is the erection of a large number of houses at a low economic rent. It was feared at one period during the year that the severe epidemic of foot-and-mouth disease would undermine the economic as well as the hygienic standards of the borough. Work at the public abattoir was interfered with and the borough was threatened with a scarcity of milk. A new public abattoir is needed. There is one private slaughter-house in the borough and only 12 of the 50 Wrexham butchers use the present public one, the remainder using slaughter-houses outside the borough. There are six common lodging-houses in Wrexham, and the question of providing a municipal model common lodging-house was considered during the year.

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At Stafford plans had actually been prepared and an estimate obtained for building separate accommodation for tuberculous cases, but this work is not to be carried out. At Cheddleton the farm buildings were stated in last year's report to be in a thoroughly insanitary condition, but they have not been renovated; the hospital badly needs verandahs for the open-air treatment of tuberculosis and acute confusional cases. It may reasonably be concluded from these facts that a central board not directly and closely acquainted with the needs of any single hospital, but responsible for several, is less likely to be sympathetic to the needs of any one of them than the average committee of management. No better illustration of the fact that "Asylum Reform" is solely a question of municipal finance could possibly be found. Many points of varied interest arise from this report. At Stafford Mental Hospital, of which Dr. B. H. Shaw is medical superintendent, a considerable amount of research is being done, the subjects of the work being sugar tolerance and intestinal bacteriology, with special reference to "a more exact method of identification and classification of the various bacteria present." Particular attention is being paid to organisms capable of producing formaldehyde, the absorption of which is regarded as a possible factor in mental disease. Several cases of dysentery occurred which were traced to a carrier of long standing, who "suddenly became excitable and faulty in her habits, thereby spreading the infection." It is complained that 80 per cent. of patients from a certain union area had been detained first for varying periods in the local Poor-law institution, thereby delaying effective treatment, whereas the total of such cases for other districts was only 17 per cent. A vacuum cleaning plant is being installed, no doubt as a sequel to the work done in this hospital in the past in investigating dust infection. The death-rate is the lowest ever recorded here (6·23 per cent.). Burntwood, which is under the medical direction of Dr. J. B. Spence, is building a cinema and a clinical laboratory. A women's "club ward," providing various amenities for well-behaved patients, such as already exists on the male side, is under consideration. Cheddleton is in danger of overcrowding. It is pointed out that a whole block is occupied by idiots and low-grade imbeciles (40 girls and 41 boys), whose removal to a more suitable institution would provide the necessary space. Great progress has, however, been made in training these cases, thanks to the enthusiasm of two sisters who were first sent to a colony for mental defectives to learn their methods. Dr. W. F. 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West Sussex.

The report of the West Sussex County Mental Hospital, Chichester, for 1923 records an increase in the number of patients, particularly on the female side, where further accommodation is an almost immediate necessity. This could be obtained by evacuating a ward used at present as sleeping quarters for nurses, which would necessitate building a separate nurses' home. It is pointed out that such homes are coming to be regarded as "absolute necessities" in large mental hospitals, and the amenities afforded by them are calculated to attract and retain in the service a better class of nurse. The Visiting Commissioner, while commenting favourably on the patients'

Hospital more fully used, and states that the accommodation there is ample for all serious complications of pregnancy, for abnormal cases of labour, and for necessitous cases. The work of the dental clinic grows. All cases of ophthalmia neonatorum are referred to the Eye Infirmary, and no impairment of sight has resulted from this disease during the past five years. The V.D. clinic opened in October, 1922, is working successfully, and patients are ready and anxious to take advantage of the local facilities for treatment.

Cambridge.

Dr. Andrew J. Laird gives details of the working of the dental clinic for expectant and nursing mothers, and children under 5. Sixty-two mothers took advantage of the treatment offered. The number of extractions was 435, the number of fillings 26, and the number of dentures supplied 28. 117 children under school age were inspected and enrolled in the dental scheme—that is to say, these children will be examined quarterly, and, if necessary, treated, to prevent the incidence of dental disease. Fourteen of these children between the ages of 4 and 5 had 223 sound teeth, 48 decayed saveable teeth, and 8 decayed unsaveable teeth. Dr. Laird reports at length on the housing question. A memorandum of January, 1923, deals with 263 houses, the rents of which vary from 2*s.* to 6*s.* per week. Fully 150 of these would in normal times be dealt with by closing orders. Dr. Laird goes on to say that the urgent requirement of the moment is a smaller and cheaper class of house. He suggests that houses containing two bedrooms with living room and scullery built in terrace form without bathrooms would be desirable. In a memorandum dated November, 1923, he gives information with regard to pre-war modern cottages. These cottages are more than 12 to the acre, the front door opens direct into the front room and there is no bathroom or bath. The area of these houses comes within the standard which entitles them to a subsidy under the Housing Act, 1923. Dr. Laird suggests that these designs, modified to include a food larder and bathroom, might meet the case. A third memorandum dated Nov. 30th, 1923, gives a list of the worst cases of overcrowding in Cambridge, some of them being extremely bad. Proceedings were taken in respect of a milk sample 13 per cent. deficient in fat. The case was dismissed following the judgment given in Hunt *v.* Richardson. In consequence the Cambridge borough council passed a resolution urging the Government to introduce legislation to prevent the sale of milk containing less than 3 per cent. of fat.

Nuneaton.

Dr. K. E. Tapper reports that the percentage of unemployed in Nuneaton has been a low one, and that additional employment has been provided by extension of various factories. The Census figures show that 5756 males are employed in mining and quarrying. The housing shortage still remains acute, though the past year has seen an increase in private enterprise. A hundred dwelling houses a year are needed to meet the growth of the population. During 1923, 89 houses were erected. Dr. Tapper states that the method of the collection of refuse needs improvement. Dust-bins are being substituted for ashpits, and the privies in the sewered areas are being gradually abolished. An extension of the sewers is also needed.

Colchester.

Dr. W. F. Corfield says that the proper housing of the people still causes a good deal of anxiety. A larger number of repairs have been insisted upon than in recent years, but the schedule shows that there are 21 houses quite irreparable, the demolition of which will be recommended as soon as it is possible. Dr. Corfield refers to 1923 as "the amazing year" from a health point of view, and mentions that the mortality of illegitimate infants was only 27·7, there being 36 illegitimate births and only one death of an illegitimate infant. Dr. Corfield regrets that the infant clinic does not seem to appeal to the poorest and most necessitous mothers who need its assistance most. He thinks such mothers do not like meeting mothers better off than themselves who will criticise the poor clothing of their babies. The amount of dried milk sold has increased and the amount given away has decreased. Dr. Corfield thinks the free milk has been of immense benefit. One case of concealment of income in order to obtain free milk occurred during the year. A return recently obtained for another purpose has made it possible to check the statements as to income made by applicants, and it was found that all statements of income given in, excepting the one referred to above, were correct.

Llanelly.

Dr. Laurence W. Pole states that special attention during 1923 has been given to the milk-supply of the town. The borough council decided to refuse registration of premises which retailed goods of a general nature. The Milk and Dairies Act of 1922 has also been used for the improvement of dairy-farms and cowsheds. Dr. Pole would like to have a more exact definition of what is meant by the distribution of milk "likely to endanger the public health." Antenatal work is making but slow progress, but Dr. Pole thinks real progress would result through the coöperation of the midwives if the town council were made the supervising authority under the Act.

In the school report it is mentioned that four classes for dull and backward children were formed during the year and have worked with very satisfactory results. Dental treatment is to be begun, as the education committee have approved the appointment of a whole-time dental surgeon. A very satisfactory report is submitted by the instructor in physical training. A class for teachers aroused much interest and only a third of the applicants could be accommodated. A physical training display was organised in June, in which 3000 children took part. About £200 were raised and this sum was utilised to send 100 boys to a holiday camp during August. For the purpose of the camp about 10 acres of land close to a good beach were obtained on the Gower coast some 20 miles from Llanelly. The description given of the camp indicates that the experiment was a great success.

Shrewsbury.

Dr. H. Gordon Smith mentions among noteworthy improvements during the year the provision of a plant for filtering, aerating, re-heating, and circulating the water in the swimming baths. Since the installation of Bell's pressure filters for the Severn water in 1900, Dr. Smith says that enteric fever has been almost unknown. These filters were renovated during 1923. In November the new Shrewsbury and Atcham joint isolation hospital was opened with accommodation for 26 patients. Dr. Smith refers to the prevalence of goitre in Shropshire, but thinks that the estimate that one in five of the female population of Shrewsbury are affected is an exaggeration. He further points out that the disease can readily be prevented by the use of a suitable form of iodine, as has been successfully done in America. An antenatal clinic, conducted by an experienced local practitioner, will be opened during the present year. Severe epidemics of measles and whooping-cough during the year made it necessary to increase the amount of free milk distributed at the centre. Owing to foot-and-mouth disease the number of animals slaughtered at the public abattoir shows a decrease. A vat has been installed for sterilising and rendering down condemned meat, to take the place of the former unsatisfactory procedure of drenching with disinfectant and delivering to a farmer for burial. Municipal housing schemes make slow but steady progress, and an impetus has been given to private enterprise during the last few months. Unfit houses are only patched, but the council intends to close a few of the worst and to offer the tenants accommodation in the municipal houses. As many of these tenants are paying very low rents they will require financial assistance to enable them to occupy the municipal houses. The housing committee also give sympathetic consideration in the allocation of houses to families affected by tuberculosis.

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classification, also suggests the provision of an admission hospital, where newly admitted patients could be kept apart from all others. This hospital has a consulting staff of five members for dental, surgical, and other specialised work, and it is implied that an additional resident medical officer will shortly be appointed, part of whose duties will consist of pathological work. There is a well-equipped laboratory which for some years has remained unused. The death-rate during the year reached the remarkably low figure of 4 per cent. An outbreak of influenza affecting 230 patients and members of the staff threw a great strain on the resources of the hospital, but no case ended fatally, and other infectious disease has been rare. Dr. H. A. Kidd, the medical superintendent, discussing the results of treatment, points out that a recovery-rate, based on all the patients admitted—including congenital cases, senile and organic dementias—does not fairly represent these results, which are shown not only in complete recovery but in relief from active symptoms, in return to orderly conduct, and in improved general health. Separate statements are made by the engineer, steward, and farm bailiff on the work of their departments.

Cardiff.

No remarkable developments are recorded by Dr. E. Goodall in the annual report of the City of Cardiff Mental Hospital for 1923. There has been little change in the number of patients under treatment. The policy of staffing male wards with female nurses is being continued, and it is interesting to note that a number of nurses are being instructed in massage. Research by the pathological staff of three members, who receive grants from the Medical Research Council, has been devoted to the same ends as those referred to in last year's report. They include the estimation of total nitrogen, sugar, and chlorides in the blood and cerebro-spinal fluid of cases of epilepsy, sugar-tolerance tests in epilepsy and general paralysis, an investigation of the toxicity of the blood-serum and corpuscles in acute insanity of various kinds, which has included attempts to produce antibodies by animal inoculations, certain radiographic work on the digestive functions (which has been published and reviewed in our columns[1]), and an "investigation of the bacterial content of the alimentary and urinary tracts," of which insufficient particulars are given to judge of its exact nature. The very large amount of biochemical work carried out during the last few years has been devoted to somewhat unpromising ends, and it is to be hoped that the staff of the best equipped research laboratory in any mental hospital in this country will not be discouraged from breaking some entirely fresh ground by the failure of their work hitherto to produce any definite or illuminating conclusions. It is with some surprise that one reads of a sporadic case of dysentery, from which the stools were sent to the County Public Health Laboratory in Cardiff for bacteriological examination, and the blood for agglutination tests to Oxford. Dysentery is not an uncommon disease in mental hospitals, and it might have been supposed that in an institution so well equipped from the laboratory standpoint as this such work could have been done on the premises.

Birmingham.

The annual report of the asylums committee of the city of Birmingham, as in former years, is a singularly complete and illuminating record of the work at Winson Green, under Dr. C. B. Roscrow, and Rubery Hill, under Dr. T. C. Graves. As an example of its thoroughness may be cited the detailed and enlightened analysis of ætiology in regard not only to the new cases admitted, but to those which recovered during the year. A comparison of these two tables yields no very striking contrasts, but it is interesting to observe that "sepsis" was regarded as a contributory cause in no less than 241 admissions, and had been present in 60 cases which recovered. In order more effectively to cope with bodily conditions whose existence may be supposed to retard recovery, there is now a visiting staff including two throat and aural surgeons, and a gynæcologist, in addition to the dental surgeon. Pathological investigations are, of course, carried out at the Hollymoor Research Laboratory, Hollymoor being an annexe of Rubery Hill. The latter is an old building, and at the present rate of admissions will soon require extension; the Visiting Commissioner expresses the hope that when this is undertaken verandahs, clinical rooms, and other amenities may be included in the plans. His only adverse comment of the administration regards the extensive use of condensed milk in the dietary. Not everyone will agree with Dr. Graves, the medical superintendent of Rubery Hill, in the following observations on occupational treatment: "The subject of employment of mentally afflicted patients has been much under discussion of late, and the term occupational therapy has been devised. I would only remark that prior to the onset of their mental breakdown patients have generally been at work. The proper way to regard employment is as a test of physical and mental capacity during convalescence, in a similar way to that adopted in sanatoria for tuberculosis by graduated exercise and work." The absence of a list of the medical staff is unusual and confusing. In the interest of veracity it should be observed that the possession by all the (assistant) medical officers at Rubery Hill of the Diploma in Psychological Medicine is not a "unique circumstance." At least one other English mental hospital, with a staff of four or five members, possesses this distinction.

Monmouthshire.

In the annual report of the Monmouthshire Asylum, Abergavenny, Dr. N. R. Phillips records a considerable increase in the population of this hospital, which, if continued, will necessitate internal re-arrangement. There is a building, Maindiff Court, which at present remains unused, and several purposes have a claim on it; separate accommodation for recent admissions, and the isolation of the tuberculous, of whom there are 31 known cases in the hospital at the present time, are perhaps the most important. Suggestions from this point of view are made in the report of the Visiting Commissioner, who also criticises the diet, certain mortuary and bathroom arrangements, the system of record-keeping, and the facilities for sterilising foul washing. It is therefore somewhat irritating to read in the remarks of the chairman of the committee that the report of His Majesty's Commissioner "was again quite satisfactory." This report also states that 31 cases of dysentery, with three deaths, occurred between August, 1922, and October, 1923, whereas the report of the medical superintendent observes: "The health of the patients generally was good, and, except for a fatal case of enteric fever and a small amount of colitis, there was no epidemic disease." The death-rate was the lowest on record for the hospital, 5·7 per cent., and the recovery-rate is rising; many patients appear to receive parole and leave on trial, but of the latter very few receive money allowances.

SCHOOL MEDICAL SERVICE.

Leeds.

THE Leeds children of subnormal nutrition are kept under strict observation. They are regularly weighed by the school nurse and the results recorded by graphs. Parents are advised as to diet and treatment where necessary, and if a child does not appear to be making sufficiently rapid progress he is presented for examination by the school doctor. Children having free meals are regularly weighed. The parent of every school child in Leeds has been given a leaflet with sensible advice on broad lines as to food and its value. This is evidently necessary. Of the

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[1] THE LANCET, 1924, i., 859.

39 children examined in the nursery school only one was found to have no defects, the other 38 giving a total of 152 various defects. The necessity for nursery schools in industrial areas is obvious, but this figure is alarming. During the autumn an epidemic of conjunctivitis due to the Koch-Weeks bacillus occurred throughout the schools in the city. Prompt measures were taken, and by the end of the year the number of cases had declined considerably, but the number of attendances for this trouble at the clinic had advanced from 4615 during 1922 to 8707 this year. The Central clinic is now completely housed in one building, with good waiting-room accommodation. The consulting rooms are bright and airy, and the new arrangement will add to the comfort of parents and children as well as to that of the staff. Overcrowding of clinics leads to hasty work, which is bound to depreciate in quality.

An interesting investigation into the incidence of defective vision in the various types of schools is given.

	Per cent.		Per cent.
Elementary schools ..	31·1	Special schools ..	38·2
Secondary schools ..	53·0	Industrial schools	55·1
Day trade schools ..	40·0		

The actual numbers of which the percentage is taken is not given, and therefore no positive deductions can be drawn, but it would be an interesting piece of research to work out the actual incidence of defective vision in these schools and to elucidate the amount of myopia in each. A percentage of 29·9 children was found at routine inspection to require treatment. Dr. Algernon Wear laments the apathy of parents with regard to dental defects. Only 39·1 per cent. of the children with dental disease were dealt with during the year. The report on physical training in Leeds is instructive, and an analysis on broad lines of the graph of school absences given at the end would be most useful.

Dewsbury.

The school medical service in Dewsbury has cost the ratepayers 0·73*d.* in the pound, or 2*s.* 1*d.* per school child. A total of 3929 children were inspected in the schools, while medical and dental consultations altogether amounted to 41,747, not including 4018 visits by nurses to the homes of the children. The average cost of each consultation and inspection, including all necessary treatment, worked out at 5*d.* a head. A special investigation into the question of stammering is being conducted, although so far there does not appear to be any class for treatment of these cases, of whom 24 boys and 13 girls have been examined. Of 1151 children inspected by the school dentist 1002 were referred for treatment, and just over two-thirds of these were actually treated, a considerable increase on last year's figure. Dr. Oscar M. Holden deplores the lack of an open-air school in Dewsbury, which he says is no exception to other industrial towns where the number of undersized men and women at present so obvious would be considerably reduced by facilities for open-air education and healthy living.

Nuneaton.

Dr. K. E. Tapper reports that the five-year-old entrants show a high percentage of defects, and he is endeavouring to bring about a closer coöperation between the school medical service and the maternity and child welfare work in Nuneaton. The school clinic, which is open daily for special inspections, had a total of 5739 attendances made by 1648 children. Chorea, both in the acute and early stages, was prevalent among those attending. There was also a large attendance of dyspeptic cases. At the minor-ailment treatment centre 698 children made altogether 5828 attendances. This clinic is held daily by one of the school nurses, a charge of 6*d.* a week being made. In addition, the school clinic is available for tonsil and adenoid operations, refractions and eye defects, dental and X ray treatment. Chronic ear discharge presents the usual problem, and it is hoped that treatment by ionisation will shortly be available for this condition.

St. Helens.

At the routine medical inspection 28·8 per cent. of children attending elementary schools and 23·8 per cent. attending secondary schools were found suffering from defects requiring treatment. Of elementary school-children 71·5 per cent. and of secondary school-children 59·2 per cent. were treated before the end of the year. Dr. Frank Hauxwell gives an interesting graph showing that a rise or fall in the percentage of the total number of cases treated by the local authority does not always mean an increase or decrease in the total number of cases treated. It is apparent, however, from a close study of the figures given, that the percentage of dental defects treated is falling, and indeed is much smaller than the percentage of medical defects treated. That the annual percentage treated should fall from 60 per cent. in 1920 to 37 per cent. in 1923 is the natural result of the increased number of inspections which have to be carried out. With only one dentist it is impossible to treat more than a certain proportion of the defects found. Dr. Hauxwell attributes the smaller proportion of dental defects treated as compared with medical defects to the apathy of parents and lack of education in this direction, as well as to restricted facilities for treatment. It is obvious that additional dental help is required here.

Lindsey.

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INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 6TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 66; scarlet fever, 1419; diphtheria, 662; enteric fever, 108; pneumonia, 419; puerperal fever, 39; cerebro-spinal fever, 4; acute poliomyelitis, 36; acute polio-encephalitis, 3; encephalitis lethargica, 47; typhus fever, 3; dysentery, 5; ophthalmia neonatorum, 121. There were no cases of cholera or plague notified during the week. The 3 cases of typhus fever were notified from St. Helens; 2 cases were notified from the same county borough in the week ended August 16th.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, none from small-pox, 5 from scarlet fever, 20 from diphtheria, 13 from measles, 17 from influenza. In London itself the diphtheria deaths numbered 8, and the deaths from infantile diarrhœa, which had been 16, 22, and 25 in the preceding three weeks, further increased to 30. A death from typhus was registered from St. Helens.

Fatal Case of Small-pox.—The death of a small-pox case reported during the week ended August 23rd was that of a female infant, aged 3 weeks, whose mother, aged 27, was also suffering from small-pox. Both were unvaccinated. In the case of the mother the rash commenced on August 2nd, and both patients were removed to hospital on August 7th. It is probable that the mother and child were infected shortly after childbirth had occurred. The child was small and wasted, weighing about 5 lb. One or two pustules appeared on the face and fingers; and attempts to vaccinate mother and child were unsuccessful. The child was fed on the bottle with dried milk. In the opinion of Dr. T. E. Francis, medical officer of health for Barnsley, who sends us these details, the small-pox was only a contributory cause of death in this case, the main cause being congenital debility.

PATHOLOGICAL AND BACTERIOLOGICAL LABORATORY ASSISTANTS' ASSOCIATION.

THE first Conference of the Pathological and Bacteriological Laboratory Assistants' Association was held from Sept. 1st to 5th in the Department of Pathology of the University of Edinburgh (by permission of Prof. J. Lorrain Smith), Mr. J. J. Ritchie (Leith) being in the chair.

This Association was founded some years before the war with the object of laying down an educational programme for laboratory assistants.[1] The attendance at the Conference was representative, there being members present from all parts of the country and also from Africa. The local organisation was in the hands of a committee appointed by the Scottish Division of the Association, and a varied programme was arranged.

The Work of the Conference.

Mr. T. D. Hamilton (Edinburgh), the Vice-President, opened the Conference with an address of welcome and read greetings from several overseas members. He then delivered a scholarly lantern lecture on Edinburgh. During the Conference the lectures and demonstrations included the Rockefeller propaganda cinema films Prevention of Malaria (lent by Dr. Andrew Balfour) and Unhooking the Hookworm (lent by Prof. R. T. Leiper); Technique in the Diagnosis of Rabies (A. Norman, Surrey): Demonstration of "Passe Partout" (Tom Read, Manchester); Demonstration of Discharge of Electricity in Gases (Dr. Carse, Edinburgh University); a Rapid Method of Macerating Bone Specimens (F. A. Izzard, Cambridge): the Method of Diagnosing Diphtheria by Toluidine Blue, as used in the Kent County Laboratory (Ernest Arnold, Maidstone): Chromogenic Organisms and Types of Tubercle Bacilli (C. R. Drury, Cambridge); Some Modifications of Staining Processes employed in Laboratory Work (A. Male, London); the Bacteriophage Phenom (d'Herelle) (J. A. Galloway); Demonstration Large Cambridge Microtome (Thomas D. Hamilton, Edinburgh); Demonstration of Various Paraffin Embedding Apparatus (W. Mason, Edinburgh). A paper was read by Mr. T. Dalling, F.R.C.V.S., on Some Small Things that Matter, and J. J. Ritchie (Leith) read a paper on the Bacteriology of Pyorrhœa Alveolaris. An item of particular interest to laboratory workers was a discussion on Laboratory Economics opened by W. A. Mitchell (Cambridge).

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THE LANCET.

LONDON: SATURDAY, SEPTEMBER 20, 1924.

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The main facts regarding London parks and open spaces are engagingly set out in one[1] of a new series of handbooks issued by the County Council. The parks are so arranged as to cater for the tastes of the public in all possible directions, and the recent debates on the question of allowing Sunday games in them afforded the public an opportunity of realising the enormous value of sunshine and air for the recreation and health of young Londoners. Other bodies control open spaces in the metropolitan area, but on the L.C.C. as paramount public health authority rests the responsibility for the prevention and treatment of disease by healthy environment. The Parks and Open Spaces Committee has long had Dr. ALAN RANDLE among its members, and concerted action is taken between this and other committees of the Council in the use of the parks for health. For example, the Education and Parks Committees together arrange for open-air schools for delicate children, which save the ratepayer the alternative of prolonged treatment in hospital or sanatorium. The healing power of the sun, convincingly shown in the Alps, is now beginning to attract the attention that it so richly deserves, and little by little London is learning to value the sun's rays that it has. Alton and Carshalton are convinced users, and the borough of Bermondsey is now seeking to set up a scheme for treatment of cases approved by the medical officer. Those acquainted with this borough will realise that if heliotherapy is possible in such a district, there is a great future for it in London, for on days when direct sunlight is not available the artificial sun can still be used, combined with open air. All who lived in London during the last big coal strike can recall the clearer air and brighter sky which then prevailed and the public should unite to strengthen the hands of the County Council in getting more adequate powers to combat the smoke nuisance. It is not enough to be able to say that London is the healthiest city ever known; as knowledge extends, that knowledge must be applied for the benefit of all citizens and the sunshine must be brought right into the homes of the people.

There is one aspect of the use of the parks which has to be constantly borne in mind by the Parks and Open Spaces Committee, and that is the feeling of the general public, which would resent any use by the authorities of open spaces for cases looked on as infective. The public regards as such any variety of tuberculosis and would require complete reassurance that no case dangerous to the general well-being was being treated in a place set aside for public recreation. The allotment of sufficient space to secure adequate privacy for a solarium would itself require careful consideration. Public interest in this matter requires just such stimulus as may be gained by a study of the L.C.C. handbook. Meanwhile, this year it has been a question of "First catch your sun."

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THE institution of a course of instruction leading to an examination for a diploma in bacteriology by the University of Manchester is an event of some importance. The study of the subject began along technological lines and mostly in relation to bacteria as causes of disease, and the field thus defined has been pretty faithfully cultivated. Development has been in natural sequence to the fundamental impression made by PASTEUR. LEEUWENHOEK knew about bacteria but no one took much interest in them until PASTEUR showed that they really mattered in ordinary human life. Hence in general, and perhaps more so in this country than in some others, "bacteriology" has been practically synonymous with "pathological bacteriology," and attention has been concentrated on the relatively insignificant number of species which live in the altogether specialised habitats necessary to their parasitic and semiparasitic modes of life. Of late considerable progress has been made in technological studies in other fields—agriculture, milk and its products, leather, and so on—and the wider outlook thus attained has proved of great advantage in helping us to understand what bacteria are and how they live. But it is quite clear that progress cannot be made indefinitely in this haphazard way and that the time has come when bacteria must be studied as such. Pathological bacteriology is now hampered everywhere by the absence of knowledge on fundamental biological matters. It is, for example, not known how bacteria multiply and whether there is, sometimes or always, something in their life-history which corresponds to a sexual mode of reproduction. This problem is intimately connected with another series of conundrums for the solution of which the epidemiologist waits—questions of variability, mutation, and transmutation. There is no botanical answer if the hygienist asks, What is a "species" of bacillus? Biologically the advantage of this wider study is equally obvious, for bacteria occupy a unique position among live things in respect of their variety of modes of life and their rapidity of multiplication; hours and days and years to a bacillus and to a man are so different quantitatively that they are almost qualitatively distinct. Bacteriology is, then, full of unsolved problems of a nature which may be called botanical, and its future progress depends largely on their solution.

The way in which practice has outrun knowledge is detrimental too in another way. So practically useful has bacteriology proved that those who engage with it are much too often overwhelmed with diagnostic tests. In many cases universities have been so captivated with this aspect of the subject that they have actually exploited it vigorously for the financial support of the department and even in some instances

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INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 6TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 66; scarlet fever, 1419; diphtheria, 662; enteric fever, 108; pneumonia, 419; puerperal fever, 39; cerebro-spinal fever, 4; acute poliomyelitis, 36; acute polio-encephalitis, 3; encephalitis lethargica, 47; typhus fever, 3; dysentery, 5; ophthalmia neonatorum, 121. There were no cases of cholera or plague notified during the week. The 3 cases of typhus fever were notified from St. Helens; 2 cases were notified from the same county borough in the week ended August 16th.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, none from small-pox, 5 from scarlet fever, 20 from diphtheria, 13 from measles, 17 from influenza. In London itself the diphtheria deaths numbered 8, and the deaths from infantile diarrhœa, which had been 16, 22, and 25 in the preceding three weeks, further increased to 30. A death from typhus was registered from St. Helens.

Fatal Case of Small-pox.—The death of a small-pox case reported during the week ended August 23rd was that of a female infant, aged 3 weeks, whose mother, aged 27, was also suffering from small-pox. Both were unvaccinated. In the case of the mother the rash commenced on August 2nd, and both patients were removed to hospital on August 7th. It is probable that the mother and child were infected shortly after childbirth had occurred. The child was small and wasted, weighing about 5 lb. One or two pustules appeared on the face and fingers, and attempts to vaccinate mother and child were unsuccessful. The child was fed on the bottle with dried milk. In the opinion of Dr. T. E. Francis, medical officer of health for Barnsley, who sends us these details, the small-pox was only a contributory cause of death in this case, the main cause being congenital debility.

PATHOLOGICAL AND BACTERIOLOGICAL LABORATORY ASSISTANTS' ASSOCIATION.

THE first Conference of the Pathological and Bacteriological Laboratory Assistants' Association was held from Sept. 1st to 5th in the Department of Pathology of the University of Edinburgh (by permission of Prof. J. Lorrain Smith), Mr. J. J. Ritchie (Leith) being in the chair.

This Association was founded some years before the war with the object of laying down an educational programme for laboratory assistants.[1] The attendance at the Conference was representative, there being members present from all parts of the country and also from Africa. The local organisation was in the hands of a committee appointed by the Scottish Division of the Association, and a varied programme was arranged.

The Work of the Conference.

Mr. T. D. Hamilton (Edinburgh), the Vice-President, opened the Conference with an address of welcome and read greetings from several overseas members. He then delivered a scholarly lantern lecture on Edinburgh. During the Conference the lectures and demonstrations included the Rockefeller propaganda cinema films Prevention of Malaria (lent by Dr. Andrew Balfour) and Unhooking the Hookworm (lent by Prof. R. T. Leiper); Technique in the Diagnosis of Rabies (A. Norman, Surrey); Demonstration of "Passe Partout" (Tom Read, Manchester); Demonstration of Discharge of Electricity in Gases (Dr. Carse, Edinburgh University); a Rapid Method of Macerating Bone Specimens (F. A. Izzard, Cambridge): the Method of Diagnosing Diphtheria by Toluidine Blue, as used in the Kent County Laboratory (Ernest Arnold, Maidstone); Chromogenic Organisms and Types of Tubercle Bacilli (C. R. Drury, Cambridge); Some Modifications of Staining Processes employed in Laboratory Work (A. Male, London); the Bacteriophage Phenomena (d'Herrelle) (J. A. Galloway); Demonstration on the Large Cambridge Microtome (Thomas D. Hamilton, Edinburgh); Demonstration of Various Paraffin Embedding Apparatus (W. Mason, Edinburgh). A paper was read by Mr. T. Dalling, F.R.C.V.S., on Some Small Things that Matter, and J. J. Ritchie (Leith) read a paper on the Bacteriology of Pyorrhœa Alveolaris. An item of particular interest to laboratory workers was a discussion on Laboratory Economics opened by W. A. Mitchell (Cambridge).

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The way in which practice has outrun knowledge is detrimental too in another way. So practically useful has bacteriology proved that those who engage with it are much too often overwhelmed with diagnostic tests. In many cases universities have been so captivated with this aspect of the subject that they have actually exploited it vigorously for the financial support of the department and even in some instances the partial maintenance of other activities. Such a practice is obviously far from the university ideal, and to it may be attributed in large part the present stagnation of the science in which no discovery of first-rate importance has been made for many years. The hygienic importance of diagnostic bacteriology is beyond question, and if it was in the proper hands—i.e., those of the medical officers of health—it would achieve even more usefulness than it has done already. But to employ those who should be finding and teaching in bacteriology to earn money is as bizarre a proceeding as it would be to charge the professors of Greek and mathematics with the duties of furnishing inscriptions for tombstones and checking the calculations of insurance companies. What there is most needed at the present time by all those who are engaged on the technological applications of bacteriology is the provision of facilities for teaching and research into how bacteria, irrespective of their human importance, live and move and have their being. How this would best be arranged no doubt varies with local circumstances; it may be in the department of hygiene or better in the department of botany. The course and diploma at Manchester are a small beginning along the right lines; we wish Prof. W. W. C. Topley all success with his enterprise.

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MILK PROBLEMS.

The Director of Water Examination may boast of the apparent ease and regularity with which London's seven million persons are supplied with water fit to drink. There is no director of milk examination for London or elsewhere, and if there were he would hang his head. The annual report of the chief medical officer for the Ministry of Health, whose remarks on the milk problem are summarised on p. 620, states that a beginning has been made in setting up new ideals in the milk trade by means of the "grading" Order. It is only a small beginning. There are now, for instance, only enough cows in the country guaranteed free from tuberculosis by the tuberculin test to supply a population of 50,000 with a pint of milk each per day. The reports of medical officers of health as they come in show that the introduction of the Order has excited little or no interest in most districts. The National Milk Publicity Council has its work before it.

The milk problem as it exists to-day, like the slum problem, is a modern one. Before the days of railways the consumer lived near the producer, the milk was delivered fresh, the dairy farms were small, the farmer's wife superintended the dairy, and his daughter did the milking. The labour was therefore of a superior type. With urbanisation and railways the farms became bigger, larger herds of cows were kept, milk no longer fresh was delivered in bulk, and the conduct of milking operations was handed over to labourers. For a long time the dairy farms remained in the towns, the herds were increased in size and housed in buildings not intended for the purpose, and tended by labour unversed in traditions of dairy cleanliness. The new conditions make necessary an even greater regard for cleanliness than in pre-railway days. The first essential therefore is education of the dairy farmer and his staff by means of agencies such as the Reading Institute—such an institute would be welcome in every dairying district—by clean milk competitions and by the efforts of county agricultural organisers. Sir George Newman remarks that the consumer can demand clean milk, the trade has shown that it can supply it, and each local authority should see that it does. But what are the facts? Although there may be sporadic signs of interest, the public as a whole is apathetic. Only a small section will agitate; the majority will content themselves with neglecting milk as an article of food unless its quality improves. No doubt if improvement occurred they would welcome it and gradually learn to use more milk. Nor have local authorities taken more interest in the matter. The milk produced in their areas is consumed elsewhere, they have been content to leave it to the farmer to satisfy his customers. Some county councils interest themselves in organising clean milk competitions, and in trying to get the district councils to combine for the appointment of veterinary inspectors. Most rural councils, however, imitate the Ministry of Agriculture in their tender treatment of agricultural interests. There are encouraging signs that the Ministry is beginning to see that the interests of the consumer and producer coincide in this matter and that a larger consumption of milk depends upon the production of a better article. Some stimulus must be provided to induce the authority supervising dairies and cowsheds to do its duty. It is open to discussion whether this object would better be secured by grants-in-aid or by transference of the responsibility from the district to the county councils.

There are statutes and Orders which would improve the condition of the milk-supply if they could be put in force. The Council of the British Medical Association recently, however, decided that the time was inopportune to press upon the Government the operation of the Milk and Dairies Act and the Tuberculosis Order of 1914. We do, however, most cordially agree with Dr. H. G. Dain, who spoke strongly on the subject at the annual meeting in Bradford, that the question of the sale of milk containing tubercle bacilli must not be shelved any longer. The position taken up by Dr. Dain is substantially as follows: As a profession we are not primarily concerned with the cost, nor are we tied to a particular method, of stopping the sale of tubercle-infected milk, although it might reasonably be made an offence to sell such milk when the addition of so harmless an impurity as water is punishable and when the vendor whose milk disseminates typhoid soon finds himself in trouble with the sanitary authority. We are told that tuberculosis in cattle is so prevalent that to eliminate all tuberculous animals would practically destroy our herds and do away with our milk-supply. To begin by searching for and destroying tuberculous cattle, compensating their owners for the loss, is not economically sound and is to attack the problem from the wrong end. The cost of tuberculosis to the community may be illustrated by the case of a boy, cured of tuberculous hip disease, whose treatment over a period of five years, including a final osteotomy to correct deformity, had cost £500 apart from any medical or surgical fees. The agriculturist, faced some years ago with a disease in potatoes which threatened the whole industry, soon discovered immune varieties of the tuber. In so serious a matter as the stamping out of tuberculosis every effort should be directed towards breeding cattle less subject to this disease. Dr. Dain's objection to reliance on the grading of milk for elimination of tubercle is that the bulk of the poorer working-class population would continue to drink the lower grades as being less costly, and the net result of grading would be to provide the well-to-do with the opportunity of escaping calamities which their poorer brethren could not avoid. Why should it not be made a punishable offence to offer for sale milk containing tubercle bacilli? It is to-day, Dr. Dain has the courage to insist, a perfectly practical thing to do.

A SUCCESSFUL ANTI-GOITRE CAMPAIGN.

In a little handbook[1] on first principles in business, Mr. A. F. Shepherd, whose services to hospital campaigns are well known, states that the only practical method whereby one can arrest attention, create interest, carry conviction, arouse desire, and move a composite public to a desired course of action, is through the process of carefully planned educational publicity suited to the present-day sociological structure. Medicine has had too few successes to record in publishing health, although Sir George Newman may be right in claiming for educational methods some share in the striking improvement of vital statistics in this country during the last decade.

Two examples reach us from abroad. The little Canton of Appenzell has been the scene during the last two years of a remarkable demonstration in health publicity. Dr. Henry Hunziker, of Adliswil, and Dr. Hans Eggenberger, of Herisau, being convinced that the ætiological prophylaxis of goitre has been solved, as they say, with as great a degree of certainty as the question of the roundness of the earth, set about inducing the 30,000 rural folk in the canton to make a habit of taking the additional modicum of iodine necessary to rid them of goitre. The simple method chosen was to add a small proportion of potassium iodide to the salt supplied by the dry-goods man. It was impossible to make this substitution compulsory, inasmuch as medical opinion in the canton was not unanimous; Dr. Eggenberger, therefore, toured the canton and gave lantern lectures in almost all the villages. Over 10 per cent. of the population took part in the discussions which followed. Both kinds of salt are on sale in the canton, the iodised salt costing two Rappen—that is to say, about one farthing—more per kilo; but as the accompanying graph clearly shows. his publicity campaign resulted

passed away, it came out that the dealer in question had nothing but iodised salt to sell; and, when this was explained to the patient, she was cured not only of her palpitation but also of her prejudice. A year previously this woman had borne in hospital a child with large congenital struma compressing the trachea; a year later, during which she took iodised salt, a lusty infant was born to her without palpable thyroid. Dr. Hunziker will only admit to having seen two patients with transient thyroid symptoms from iodism. Both were taking iodised salt, but one had consumed also three bottles of Wildegger iodine water and the other had taken chocolate tablets of iodostarin, both of which increased the iodine ration by one hundred times or more. The result of the campaign, as Dr. Hunziker sets out, after two years' experience, is that no goitrous being comes into the world, and no new goitres develop in Appenzell. Measurement of existing goitres shows a diminution in all the young forms and some of the older. Iodised salt, in the author's opinion, is to be regarded not as a medicine but as a food which is able to free Switzerland and other goitrous countries from goitre and cretinism. On a small scale the result certainly seems to be as striking as the claim.

The second example is in progress in New Zealand where the problem of goitre is urgent, and the iodine theory, if not universally accepted, is being tested with provisional conviction. Prof. A. M. Drennan, of Dunedin, is working on the relation to goitre of iodine in the soil and in vegetables grown on that soil, but is not prepared yet with a final answer. In a volume of studies[3] from the Otago Medical School, Dr. C. E. Hercus and Dr. E. S. Baker analyse the rival theories for the origin of endemic goitre and find in New Zealand the geological aspect of the problem alone worthy of further consideration. It is along river valleys, on plains formed from sedimentary deposits out of which soluble salts have been washed, that endemic goitre occurs. In such areas a census has shown a high percentage of thyroid hypertrophy in the fifth year of life with increased incidence,

Annotations.

"Ne quid nimis."

THE VITAL STATISTICS OF 1923.[1]

WHATEVER advantages the present system of issuing the matter once contained in a single volume in three may possess, to the journalist it is an unmixed evil. He must either abstain from comment or run the risk of doing ill what Dr. T. H. D. Stevenson will do well in another instalment of the official records. Yet we cannot pass this great, this impressive record without a word. In 1923, 444,785 persons died, the smallest total of deaths since 1862, when the population was little more than twenty millions—now it is more than thirty-eight millions. The standardised death-rate was 10·3 per 1000, less than half what it was in 1841–50, 40 per cent. short of the death-rate Farr proposed as an attainable but unattained ideal 50 years ago. The rate of mortality in childhood, ages 0–5, is one-third of what it was in 1841–50, the rate of infant mortality has declined from 153 to 69 per 1000 births. The rate of mortality from tuberculosis (persons), which was 1352 per million living in 1913, was 1062 in 1923. This story is repeated in so many lines of the figures, the improvement is so general that one is reminded of Polycrates and seeks for a ring to sacrifice, for some sign of a deterioration which may propitiate the envy of the gods. Of course, the layman will find it without any seeking in the advancing death-rate from cancer; more deaths from cancer occurred in 1923 (22,065 men, 26,603 women) than in any previous year; the death-rate was 19 per cent. higher than in 1913. Yet the gods may think the sacrifice insufficient, for at the later ages of life, the ages when mortality from cancer becomes considerable, the general death-rate has been reduced very greatly. For instance, 48 per cent. of deaths of males from cancer, and 46 per cent. of deaths of women from cancer, occurred between the ages of 45 and 65. Taking as the standard of comparison so recent a year as 1913, we find that the death-rate in 1923 of males aged 45–55 years was 74 per cent., and of males aged 55–65, 78 per cent. of the rates in 1913; the percentage ratios for women are also 74 and 78. The increase in rate of mortality from cancer is so much over-compensated by the decreased risk of dying from other causes that even at the cancer ages the likelihood of dying at all within a year is less than it has ever been. It is hardly necessary to suppose that our bad habits of drinking hot tea, paying no heed to our colons, and generally neglecting the warnings of prophets within and without the medical profession, have really increased the powers of the cancer dragon; but that it really is a dragon can hardly remain in doubt after a visit to the British Empire Exhibition. For suppose a population of distressed damsels exposed to the ravages of a dragon and of a well-directed battery of machine guns; then since, according to the best mediæval authorities, dragons only devour living maidens, the rate of mortality per machine gun is likely to exceed the mortality *per draconem*. Now expose a population of the same size, or larger, to a dragon of equal appetite and no competitors, then, unless we suppose that the old dragon ate not only as many as he could but also as many as he would, the new rate of dragon mortality will be absolutely as well as relatively much higher than before. In fact, even an increasing *rate* of mortality from cancer, if associated with a decreasing rate of mortality from all causes, does not involve as a logical consequence any absolute increase of cancro-genetic factors at all. Perhaps then we should seek our object of sacrifice in the increasing mortality from encephalitis lethargica, and in the still large attribution of deaths to influenza; the number dying from the latter in 1923 was much smaller than in 1922, but exceeded 8000. Indeed, it cannot be proved that the development of some new infection or the transformation and increase of virulence of some old infection might not bring back the rates of mortality of 50 or 100 years ago. Such a thing has happened before: England in the fourteenth century, Rome in Justinian's time no doubt had far higher death-rates than in earlier times. The thing *may* happen; but the most pessimist philosopher would hardly aver that it is likely to happen, having regard to the relatively small success of the onslaught in 1918 of influenza and the recovery made by our general death-rate since then.

DENTAL DRESSERS IN DERBYSHIRE.

THE Derbyshire scheme for dental treatment by means of school dentists, aided by dental dressers who have had 12 months' training at school clinics and who act only under the personal supervision of a registered dentist, appears to have worked well, judging from the tables of comparative statistics for various counties given in the annual report of the school medical officer for 1923. Nevertheless, the scheme may lapse at the end of this year unless the Order issued by Sir Alred Mond in August, 1922, is modified. Dr. Sidney Barwise pleads for an extension of the time-limit until more dentists are available. He outlines the New Zealand scheme, which differs in important particulars from that in Derbyshire; for in New Zealand dental dressers after two years' training in a dental hospital may work quite apart from the registered school dentist. Indeed, there are in the New Zealand Service only eight qualified dentists. The difficulty appears to be purely a question of coping with the enormous amount of work involved in the treatment of the teeth of our large school population. There is, evidently, no fear of the work being scamped, provided the services of the right type of registered dentist are available for supervision and training. The testimony of dentists of the highest standing who have been in constant touch with the work of these dressers, and the X ray photographs of fillings reproduced in the report, are ample guarantee of the quality of work done. At present there are not sufficient dentists to go round, and there is little prospect of the number increasing to an extent sufficient for the country, more especially the rural districts, while children's teeth are in a notoriously bad state, 80 per cent. at least of the school population requiring treatment. The Derbyshire scheme is running smoothly and effectively, and the teeth of the Derbyshire children are being properly attended to—the numbers given in the comparative tables speak for themselves—so that it seems a pity to disturb the scheme until an adequate substitute is available. The dental dressers are well-educated intelligent girls of matriculation standard; they work only under the personal supervision of a registered dentist, and Dr. Barwise is of opinion that their work should not be limited to "cleaning and polishing, applying or removing dressings or temporary fillings, charting, recording, and work of like responsibility" as laid down by the Mond Order, but that they should be allowed to continue doing the dental work of a routine character such as (*a*) the examination of children's teeth with a probe and mirror, (*b*) extraction and treatment of temporary teeth, (*c*) treatment of the first permanent molars, the remaining responsible work being left to a registered dentist. The trouble is, Dr. Barwise says, that unless the dental dresser is allowed to do those things she is really not of much use. A registered dentist under the new Order may undertake operative work while supervising the work of two dental dressers. If not operating he may supervise the work of six dressers, all cleaning, polishing, applying or removing dressings or temporary fillings, charting, and recording, but meanwhile no one is doing the permanent fillings or extractions which make up the bulk of the school medical work. By preventive measures, that is by intensive work on the younger age-groups, it ought to be possible in a few years to reduce the operative work necessary among school-children to dimensions proportionate to the number of dentists available, but at present owing to the enormous demand of the older children in a great many districts this is quite impossible. The Derbyshire scheme meets this situation and is devoid of possible abuse, for the dental dressers are trained at the school clinics by the school dentists, and there is no possibility of their ever establishing themselves in opposition to the registered practitioner.

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[1] The Registrar-General's Statistical Review of England and Wales for the Year 1923. Tables, Part I., Medical. H.M. Stationery Office. 15s.

A BIOGENETIC VIEW OF INSANITY.

DURING the period 1901–13 the admissions to the mental ward of the Eastern District Hospital, Glasgow, included some thousands of insane patients who were treated under hospital conditions without certification. An account of this enterprise, and of its bearing on the great problems connected with the treatment of the insane, was given by Dr. John Carswell in a Maudsley lecture[1] delivered before the quarterly meeting of the Medico-Psychological Association in May last. Since proposals for instituting similar treatment in England are under consideration and trial at the present time in various places, the conclusions drawn by Dr. Carswell demand investigation. The statistics referring to patients are composed of figures so large that their significance is, at least on that ground, unassailable. They show that there was no important variation in the ratio of insane to the total population throughout the period during which the experiment was under trial, and that the incidence of insanity was not remarkably greater in districts with a death-rate above the average for the city than in those, presumably healthier and better-to-do, areas whose death-rate was below the normal. These figures refer to the age-period 15–45, but over the age of 45 the incidence of insanity is considerably higher in the poorer districts (assuming that a high death-rate indicates poverty). Now, Dr. Carswell regarded the large majority of his cases under 45 as due to "constitutional instability," by which he appears to mean a congenital, as opposed to an environmental, cause, and from the foregoing data it would appear that hereditary causes are equally operative among the poor and the well-to-do. On this ground he opposes the contention that "improvement of social conditions means the preservation of the unfit, and consequently a higher producton of insanity." Here we are on ground common to medicine and statesmanship, contentious enough even at the present time, and closely connected with the problem of over-population, which bids fair in time to overshadow every other political issue. For that reason Dr. Carswell's contribution is the more welcome. But perhaps the question is not as simple as he would have us believe. It has not been shown, for example, that physical and mental "unfit"-ness are parallel phenomena, nor do the "eugenic" arguments to which he takes so strong an objection refer solely to the latter type. If there is any sort of mental disorder notably more common in the lower classes than in any other, it is that of the minor degrees of mental defect, often compatible with an efficient life of manual labour, but precluding any more skilled or responsible work; these men and women are outside the scope of Dr. Carswell's figures, because they never receive institutional care. The reply of the eugenist to Dr. Carswell would be that his object is to eradicate the mentally defective and unstable from any and every class; "better social conditions" are only deplorable in this sense, in so far as they enable the mentally defective to propagate freely, a qualification which demands much closer consideration of what exactly is involved in these better conditions. Nor can we unreservedly accept Dr. Carswell's statistics as to ætiology. "Constitutional disability" (adolescence, congenital defect, heredity, epilepsy, and the climacteric), "toxic causes" (syphilis, alcoholism, exhaustion states, and the effects of acute bodily diseases), "gross brain diseases," and "senile changes," are held so largely accountable for his 909 cases of well-ascertained ætiology that "all other factors in the production of insanity are practically negligible as contributory elements in the total mass of insane persons." Do we really understand insanity as well as this dogmatic statement would imply? It has been said that a man may have syphilis and a broken neck; may it not also be said that a man may be an alcoholic, or exhausted, or convalescent from an acute bodily illness, and yet become insane from quite another cause? In extending the hypothesis of "biogenetic" origin to most forms of insanity occurring before the age of 45, Dr. Carswell presents insanity in the light of an affliction singularly unamenable to the prophylactic measures which are summed up in the expression "mental hygiene." We believe that to discount the psychogenic element in acquired insanity, to accept any obvious antecedent morbid conditions as a sufficient explanation for it, is to go far beyond our knowledge of its real origins, and with every respect for the magnificent volume of work represented in these figures, it must be submitted that, to the extent that they depend on views of ætiology, the conclusions to which they lead can only be accepted with reserve.

THE PHOTOGRAPHIC EXHIBITION.

THE sixty-ninth annual exhibition of the Royal Photographic Society, opened at the galleries of the Society, 35, Russell-square, W.C., on Sept. 13th, is a very brilliant one, well in advance of its immediate predecessors and a remarkable contrast to those with which we were familiar before the war. The contrast has particular reference to the striking advance made in the application of photography in various technical directions, in medicine and in science generally, in trades and manufactures in an infinite number of ways. Whilst the pictorial side of the art has not been neglected, the scientific and technical section now represents the greater part of the exhibition. It is amusing and instructive to remember that some 12 or 15 years ago this section occupied a few feet of wall space in a remote corner of an unimportant room, where it was overlooked or charitably tolerated as "interesting." One misses some of the amenities of the old exhibitions when the larger space of the New Gallery permitted the trade exhibits of apparatus and demonstrations of certain processes. At the Society's house there is inevitably some overcrowding and an almost bewildering wealth of exhibits, although the dealers are limited to advertising pictorially the capabilities of their productions. Photography has always been popular among medical men, partly as a hobby, partly as an opportunity to secure exact records, whether of specimens or cards, or as photo-micrographs, or, in more recent times, on the radiographic side. Some particularly fine specimens are exhibited by Dr. G. H. Rodman, past President of the Society. His photo-micrographs of sections of human muscle affected by trichiniasis show the cysts very clearly in situ and afford an opportunity of seeing what is in this country a rare condition. Dr. G. S. Sansom, who also distinguishes himself on the pictorial side with some excellent transparencies, has some photo-micrographs of embryological subjects. The radiograms of Dr. G. Baer, of Zurich, are instantaneous studies of the duodenum after an opaque meal; they are taken at frequent intervals and so afford a kinematographic demonstration. There are a large number of radiograms from negatives made at various hospitals in Great Britain, but particular attention may be directed to a pair showing the lungs in full inspiration and expiration respectively. Although a certain amount of criticism always attaches to photographic results which are at the same time made semi-diagrammatic, in these examples the diaphragmatic movements, the lighting up of the apices, and the general appearance due to pulmonary expansion are most instructive. Apart from the purely professional side there is much in the exhibition of general interest to appeal to any medical man whatever his tastes and hobbies. The exhibition will remain open until Oct. 25th from 11 A.M. till 9 P.M. daily (Sundays excepted), and it may be added that admission is free.

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[1] Journal of Mental Science, July, 1924.

AN INFECTION WITH ALL THREE MALARIAL PARASITES.

MALARIAL infections vary greatly in their amenability to treatment by quinine, although opportunity seldom arises to prove this in the history of a single case. Hence the particular interest of a report by Dr. Kadri Mehemmed,[1] a medical officer in the Turkish Army in Asia Minor, on a patient in Cilicia who complained of pain in the abdomen, diarrhœa, and daily attacks of fever, with a long history of malaria. When his blood was examined next day a severe infection with both benign tertian and quartan was found, and a slighter infection with subtertian crescents. Two days later he was put on quinine, 15 gr. daily in four divided doses. Eighty hours later, after the patient had taken 52 gr. in all, no benign parasites at all were observed, but only deformed quartan parasites and crescents. The patient was put on 15 gr. daily for seven days, thereafter on half doses, and after three weeks' treatment only crescents and very few of them were to be seen; the diarrhœa had ceased, and the spleen had become normal in size. The after-history of this case should be interesting, for although in the early stages of infection the benign tertian parasite is the form most easily dealt with by quinine, the successful treatment of a relapsing case is one of the most difficult problems in malaria; relapses are apt to continue in spite of the use of quinine in full doses. Dr. Mehemmed's patient was fortunate if the check to infection was lasting.

MONOGRAPHS OR SYSTEMS OF MEDICINE.

THE multiplication of medical literature and the increase in known facts concerning medical science have in recent years produced a situation which must be full of embarrassment to both donor and recipient, for many special works are available, and the data have become at the same time so unwieldy that even the best of general books is bound to have omitted many important facts. There is evidence that editors to-day shrink from the complexity of attempting to bring out new text-books of medicine, but we have been able in our review columns to welcome several daring and successful ventures in this respect. Dr. E. P. Poulton's revision of "Taylor's Medicine," and Dr. Frederick Price's "System of Medicine," may be quoted as illustrations. But a system of medicine in many volumes is an even more difficult task; it cannot be attempted without the collaboration of many writers, and it is almost inevitable that the work must in some respects be out of date before it reaches the reader's hands. In France this difficulty is to some extent met by issuing finished volumes as soon as each is completed, and it is noteworthy that no less than three different systems, one of which will have when completed more than 30 volumes, are appearing in this manner from Paris. In our review columns to-day will be found an account of a new "System" recently published in the United States; whilst apparently not free from the defects which must occur in any work of these dimensions, this ten-volume series contains many remarkable chapters on different aspects of disease. It has the advantage of being issued in a leather binding with the pages held together by the loose-leaf system, a feature which we believe was first introduced into medical literature in "Oxford Medicine," a six-volume work by various English and American writers which was published by the American branch of the Oxford University Press, under the general editorship of Prof. Christian and Sir James Mackenzie. The new ten-volume work, whose title is "Tice's Practice of Medicine," introduces a further novelty in the form of an annual supplement by which subscribers can each year receive new pages to be incorporated in the text so as to bring it completely up to date.

To possess such works as these is to possess a library; the cost is necessarily great, and would allow the purchaser, for the same expenditure, to buy a series of standard works whose contents might, perhaps, more fully cover the field of medical science. But there is certainly something convenient in the possibility of preserving the subject-matter under a series of uniform covers, and for this reason we believe that the loose-leaf method will enjoy popularity.

PROF. PAVLOV'S SEVENTY-FIFTH BIRTHDAY.

Ivan Petrovitch Pavlov, the great Russian physiologist, attains on Sept. 27th his seventy-fifth birthday, covered with distinctions and international honours. At Leningrad the event will be celebrated by the publication of a *Festschrift* in the form of a special number of the *Archives of Biological Science*, the official organ of the Institute of Experimental Medicine, of which Pavlov is honorary director. Appropriately, we have received from one of Pavlov's former colleagues, Prof. W. N. Boldyreff, who is now Director of the Pavlov Institute of the Battle Creek Sanitarium, U.S.A., an interesting biography of the man who may be said to have raised physiology to the level of an exact science. Prof. Boldyreff divides Pavlov's studies into three groups: investigations on (1) the heart and circulation of the blood; (2) the digestive system; and (3) the physiology of the brain and the organs of sense.

In the first period of his scientific work he studied in detail the innervation of the blood-vessels and of the heart. As a result of this, he brought out a report on the work of the special branches of the vagus nerve. In 1885, and earlier (1877), he published papers on the accommodating mechanism of the blood-vessels. Even at that time he was interested in the physiology of digestion and published some excellent articles on this subject, among them being papers on the nervous mechanism of pancreas juice secretion (1878). During the same period, under the guidance of Ludwig, Pavlov reported studies on the innervation of the left ventricle of the heart and, in collaboration with Heidenhain, he fully investigated the nerve-muscle mechanism of the opening and closing of the operculum of the snail. Early in his scientific career (1879) he described a new method of operation for the pancreas fistula. In 1890 he made his discovery regarding the influence of the vagus nerve upon the process of secretion in the gastric glands. Simultaneously he invented his method for obtaining the gastric juice of dogs, the famous "sham feeding method." The results of these discoveries were so interesting and encouraging that he turned his entire time and interest to the study of the nerve-physiology of the digestive organs, and shortly thereafter he perfected his method of operation for the isolated stomach-pouch. To Pavlov we also owe our knowledge of the influence of the vagus and sympathetic nerves upon the secretion of the pancreas and two excellent methods for demonstrating the mechanism of the action of these nerves. The first method is to excite the sympathetic nerves by mechanical stimulation with the Heidenhain tetano-motor. The second method involves a special operation on the animal by which, with the automatic stimulation of the vagus nerve by the Dubois-Raymond inductorium, the secretion of the pancreas is obtained.

In his preface to the biographical sketch Prof. Boldyreff tells of the hardships Pavlov was forced to undergo as a consequence of the Russian revolution in 1917. The great scientist, he says, who had done so much to relieve the sufferings of others, was himself compelled to suffer want and hunger, and, at an advanced age, to spend the time and energy so valuable to science in manual labour to provide food for his family, in addition to performing the humblest domestic duties and household drudgery. In spite of these efforts, especially in the years 1920 and 1921, he and his family suffered severely from the lack of food due to the bad harvest in Russia. During this time he was helped as well as cheered by the contributions of his scientific colleagues in foreign lands, who made great and persistent efforts to send him aid at a time when such a multitude of eminent Russian scientists and thousands of the common people perished from starvation and disease. In the midst of all his tribulations Prof. Pavlov's courage and fortitude never failed him. He even continued his scientific work in the face of great difficulties; and surrounded by his faithful though hungry pupils, hungry himself, in an unheated building, with water pipes frozen and no light other than that from burning faggots, he encouraged and inspired his assistants by his courageous example in continuing the important scientific work to which his life has been devoted.

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[1] Archiv für Schiffs- u. Tropen-Hygiene, June, 1924.

BENIGN TUMOURS OF THE PLACENTA.

IN a recent communication to the Chicago Gynecological Society, Dr. R. A. Scott,[1] of the obstetrical service of the Evanston Hospital, Illinois, records an illustrative case, with a review of the literature, of benign tumours of the placenta. Yamato in 1913 collected 116 cases, in addition to which Dr. Scott has found reports of 36 other cases. The first case on record, of which an interesting extract is given, was reported by John Clark in the Philosophical Transactions of the Royal Society in 1798. The tumours are generally found in the midst of the placental tissue in the chorionic membrane, protruding as a rule on the fœtal surface of the placenta. The majority are encapsulated. The tumours consist of sharply defined nodules of lobulated structure, connected with the chorionic epithelium by one or more pedicles and with the rest of the placental tissue in various ways by secondary fibrinous adhesions, lying in the intervillous space and touching neither the chorionic epithelium nor the decidua directly. The tumours are usually solitary, but multiple growths have been observed. The majority of patients are under 30 years of age and primiparous. The health has usually been good before and during pregnancy. There was not a single instance of maternal syphilis in Yamato's series of 116 cases. In size the tumour usually varies from that of a walnut to that of a kidney, but in a few instances the tumour has covered two-thirds of the placental area. It appears to play little part in the pathology of labour. The chief microscopical features are the embryonic connective tissue and the cavernous capillary proliferation. The chorionic epithelium is involved only secondarily in the proliferation, and is an entirely subordinate menace. Dr. Scott's patient was a primigravida aged 32 years. The pregnancy was normal, the urine negative, and the blood pressure 118 mm. Labour took place spontaneously at full term, delivery being effected by low forceps. The placenta was expelled 15 minutes later by the Duncan method. The baby weighed 6 lb. 12½ oz. and was in good condition. Examination of the placenta, which measured 20 by 18 by 3 cm., showed a dark-red firm mass of uniform tissue, measuring 5 by 4·5 by 2·5 cm. and weighing 70 g., situated opposite the attachment of the umbilical cord and in the placental substance. The mass was encapsulated and could be shelled out of its capsule. On microscopic examination multiple blood-vessel spaces of irregular size were seen filled with blood and lined with epithelium. Most of the blood-vessels had thin walls, but occasionally there were groups of large thick-walled vessels resembling arteries. The diagnosis was hæmangioma of the placenta.

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[1] Surgery, Gynecology, and Obstetrics, August, 1924.

THE RECOVERY OF THE VOLUNTARY HOSPITALS.

THERE was a brief period, after the war, when the outlook for the voluntary hospitals of this country seemed dark. The repeated story of accumulated dilapidations, rising salaries, and soaring cost of renewing equipment, depressed even enthusiasts for the voluntary system, and rumour had it that complete recovery was hardly to be looked for. At this stage, when enterprise was constantly being embarrassed and baffled by difficulties, the Government stepped in and offered the sum of £500,000 as a special emergency grant to be administered only to those hospitals which showed a lively disposition to help themselves. The Voluntary Hospitals Commission, who were appointed in 1921 to distribute this sum, were instructed, after the settlement of some urgent claims, to disburse money only pro rata against new money raised or about to be raised by the charity. This stringent condition, which has doubtless led to hardships in individual cases and has been sharply criticised, has justified itself. The second interim report of the Voluntary Hospitals Commission, which has just reached us, leaves no doubt whatever on this point, or that the timely stimulation has brought about a wonderful recuperation if not indeed a cure. It will be remembered that the first interim report of the Commission[1] recording the distribution of £372,000 was published in February, 1923. By March 31st of that year a further £55,000 had been allocated, leaving £73,000 to be used to assist those hospitals with serious accumulated deficits. A sum of £46,000 was allocated to England and Wales and £27,000 to Scotland. Local committees were asked to submit proposals for distributing the sum allocated to their area among the hospitals within it, and they were also urged to raise county funds, in order to facilitate compliance with the Treasury condition as to new money. The supplementary distribution proceeded, with the help of the local committees, until the latter part of 1923, when it was decided that the sum of £16,866 still at the disposal of the Commission should be distributed so far as possible to assist hospitals which were in acute financial difficulties, but for various reasons had been unable to receive an adequate measure of assistance from the Government grant. This final distribution was made easier by a special concession granted by the Treasury. Under an amending regulation the Commission were given a discretion to waive the condition as to new money in exceptionally hard cases, and were able to make grants to a few deserving hospitals which could not otherwise have been assisted. The sum distributed, however, without requiring the equivalent amount of new money to be raised, was only between £6000 and £7000. A complete detailed list of all the grants paid to hospitals is given in appendices. The Commission praise the local voluntary hospital committees, who in most of the areas have assisted in organising and coördinating the raising of funds, and have secured, inter alia, the adoption of a uniform system of accounts. Some of these committees have issued valuable reports[2] in which they have envisaged the hospital needs of their area as a whole and have indicated the possibilities of coöperation between the institutions in the area. Having completed the distribution of the grant, the Commission are now directing their attention, at the request of the Minister of Health, to the need for additional voluntary hospital accommodation and the best means of providing and maintaining it, and not till this investigation is completed, and perhaps not then, will their task be finished. The fact that an inquiry into the provision of more beds seems worth pursuing is sufficient answer to those who are still gloomy about the prospects of maintaining the present quota of voluntary hospital beds. The comment on the present financial position of the hospitals in the final section of this interim report is that "there is substantial ground for the hope that the voluntary hospitals will, for the most part, be able to balance their budgets. They are actively exploring the possibilities of securing additional income and in general the deficits appear to be decreasing. In some instances the recovery has been astonishingly rapid, and the situation as a whole is decidedly more hopeful than we had any reason to anticipate when we began our work. We believe that the recovery of the voluntary hospitals will continue, and that their financial position is approaching a more stable and satisfactory condition." This is a more encouraging statement than anyone could have anticipated in 1921.

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[1] See THE LANCET, 1923, i., 446.

[2] See THE LANCET, 1923, i., 969.

MENTAL SERVICES OF THE M.A.B.

THE Mental Services Section of the report of the Metropolitan Asylums Board, summarised on another page, is enriched by a review of work undertaken at Caterham Mental Hospital laboratory, by Dr. J. Leslie Gordon, and by four original articles of unusual merit, notably on the Diagnosis of Mental Deficiency, by Dr. E. B. Sherlock; on Syphilis as an Ætiological Factor in Mongolian Idiocy, by Dr. R. M. Stewart and Dr. D. O. Riddel; on An Application of the Methods of Industrial Psychology to Mentally Defective Persons, by Dr. P. D. McGowan and Dr. John Ross; and on Cases Illustrating the After-effects of Encephalitis Lethargica, by Dr. Charles Glen. In the first of these Dr. Sherlock criticises the well-known "Intelligence" tests, and suggests the application of tests designed to investigate capacity for sensation, memory, and reasoning. He gives examples of questions, ingeniously framed to eliminate guesses, designed to help an examiner to judge the extent to which the defective appreciates time, causal, spatial, and other relations. In some cases the mere ability to understand the question put may supply evidence that the relation involved is appreciated. About the tests there is an illusory appearance of simplicity. For example, the first question under the heading Spatial Relation proposed in the sample scheme is: Draw a straight line and then mark it so that one part shall be twice as long as the other. As originally planned, the wording of this question was "Mark the middle of this line," but this proved so easy for feeble-minded persons that the test given above was substituted. Yet, as shown by H. K. Wolfe, the apparently simple business of marking the middle point of a line raises all sorts of issues in reference to the influence of the age, sex, and experience of the person tested, the length or direction of the line, the variability of error, and so on. Again, though either test will do as a means of detecting the ability to cognize a relation, there has been found little correlation between the "static" form of spatial perception required for the estimation of the lengths of two portions of a line and the "dynamic" form involved in drawing a line of a given length. Actual employment of the tests has brought out unexpected possibilities of error, misunderstanding, novel implication, or legitimate difference of opinion. In order that there might be collected some evidence bearing upon the actual utility of the tests, they have been applied to (1) a group of boys at a preparatory school; (2) groups of higher-grade male and female children at Darenth Training Colony; (3) a group of female nurses; (4) sundry persons casually met with in daily intercourse. The results have been found full of interest and with a considerable measure of value. Dr. Sherlock doubts whether these tests will lend themselves to any process of standardisation on an age basis, but suggests that if the principles underlying them are accepted as sound, they seem likely to be of assistance in arriving at a decision upon the extent of a person's need for "care, supervision and control." They are, at any rate, not purely empirical, but serve for the measurement of a fundamental process of thought, the cognition of relations. We recommend all those interested in the progress of mental hospitals to study this section of the report, which can be obtained separately (price 1s.).

VASECTOMY IN GERMANY.

A SHORT note in the *Deutsche Medizinische Wochenschrift* for August 15th by Dr. Levy-Lenz, under the heading of "Zur Technik der Ambulanten Steinach-Operation," gives the impression that this operation is being performed on a large scale in Germany. Dr. Levy-Lenz speaks of a personal experience of some 50 cases, the use of the word "some" suggesting that a few Steinach operations more or less hardly count. He betrays no great enthusiasm for the results and admits that he has seen no improvement when the operation has been performed for normal old age. But when old age has been premature and has been associated with slight mental depression, he has known the operation to be beneficial. As for the observations of other surgeons, he finds that opinions differ widely. This, he thinks, may be because some surgeons have been more discriminating than others in their choice of patients. But the most striking feature of Dr. Levy-Lenz's note is his description of the ease, facility, and rapidity with which vaso-ligature, according to Steinach's technique, is now being performed in Germany. It seems to have become an out-patient or consulting-room incident. The operation, we are told, is perfectly free from danger at the time and also from unpleasant sequels. All that is needed for it are scissors, a knife, two surgical forceps, a stout probe, silk, a needle, a one-tooth hook forceps, and a local anæsthesia outfit. The vas is gripped through the skin of the scrotum as near to the testicle as possible, is isolated from the other constituents of the cord, and is secured in a longitudinal fold of the skin. The skin is disinfected, the local anæsthetic is injected, and a 2 cm. long incision is made over the vas, which is laid bare and pulled forward with the help of the probe. It is then ligatured at two points with silk and divided. The wound in the skin is closed, a small dressing is applied, and a suspensory bandage is worn for 14 days. Dr. Levy-Lenz says that the whole operation takes from five to ten minutes, but that, apart from a transitory "flare-up," results should not be expected till four to six months after the operation.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

A. L. McDonnell to be Surg. Lieut.

Surg. Capt. R. W. G. Stewart to *President*, for post-graduate course.

Surg. Comdrs.: E. S. Wilkinson to *Ramillies*; G. B. Scott to *Resolution*; W. W. Keir and H. St. C. Colson to *President*, for survey of medical stores at R.N. Medical Depôt, Deptford; D. H. C. Given to *President*, for post-graduate course; G. B. Cockrem to *Despatch*; and R. Thompson to *Marlborough*.

Surg. Lts.: W. J. McB. Allan to *Ramillies*; S. G. Weldon to *Marlborough*; and Surg. Lt. (D.) H. J. Luck to *Malaya*.

Surg. Lt.-Comdrs.: A. W. Gunn to *Centurion*; P. W. Carruthers to *Impregnable*; and I. S. Gabe to *Fisgard*.

C. C. Grummitt has been appointed Admiralty Surgeon and Agent for Hove, in addition to Brighton.

ROYAL ARMY MEDICAL CORPS.

Capt. Alexander S. Newton to be temp. Capt. whilst empld. as a Dental Surg.

ARMY RESERVE OF OFFICERS.

Lt.-Col. H. A. Harbison ceases to belong to the Res. of Off. on account of physical unfitness.

TERRITORIAL ARMY.

C. Alison (late R.A.M.C.) to be Lt.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Col. W. H. Kenrick.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXVIII.

TREATMENT OF EPIDEMIC ENCEPHALITIS (ENCEPHALITIS LETHARGICA).

THE early diagnosis of epidemic encephalitis is of importance, not because there is a specific treatment as in diphtheria, which must be given early to be effective, but because some of the conditions which simulate it, such as intracranial tumour or abscess, cerebro-spinal fever, cerebral syphilis, uræmia, and various drug poisons, call for quite other treatment, the delay or omission of which may be of serious import. Conversely also, some cases of encephalitis may easily be mistaken for other conditions. Painful abdominal myoclonus has been diagnosed as an acute emergency, and laparotomy performed in consequence; whilst the curious moral changes of behaviour, which so often occur in children as the result of this infection, have in some instances been dealt with as wilful naughtiness with most unhappy results. A definite diagnosis cannot, however, be made until characteristic nervous signs show themselves. Early or premonitory general symptoms may be present in some cases for days, in others for weeks, but there is nothing distinctive either in their character or in their grouping. Thus by the time that its presence is recognisable the poison has already reached the nervous system.

Disinfection.—It is believed that the primary site of infection is the mucous membrane of the mouth and naso-pharynx. Measures may therefore be taken to disinfect these regions from the first. Potassium permanganate solution (1/1000) was found by Levaditi to be particularly effective in destroying his virus under experimental conditions, and there is thus some justification for preferring it for this purpose.

Rest.—Rest in bed is clearly indicated in severe cases, and in them not difficult to enforce, but it is sometimes not easy to persuade a patient suffering from nothing but a slight diplopia to remain in bed for some days. However, the mildest case may at any moment develop into one of serious character. Many fatal cases have for varying periods seemed to be exceedingly mild. Whether any of these would have run a less serious course had they been kept in bed from the first it is not possible to say, but it seems reasonable to insist that any person suffering from an acute infection of the central nervous system should be kept in bed at any rate until the acute stage may be assumed to be over, however slight that infection may appear to be.

Isolation.—The question of isolation is one of considerable difficulty, seeing that instances of direct infection are extremely rare. Theoretically no doubt it is desirable, but practically it is impossible to carry out a complete scheme of isolation based upon our scanty knowledge as to the conditions of transmission, or the period of infectivity. General measures as regards the hygiene of the sick-room should be adopted. At the Sheffield City Fever Hospital, where large numbers of cases have been under treatment during the recent outbreak, those kept out in the open all day appear to have been less excitable and to sleep better.

Diet.—Food should be light and palatable. In the acute restless cases the difficulty of feeding is often as great as in severe cases of chorea, and it is important to make sure that adequate quantities are taken. Some of these cases lose flesh rapidly. The same applies to the very lethargic patients, who will go for hours together without food unless made to take it. Dysphagia from bulbar lesions may add to the difficulties in some cases; it is usually only temporary.

Management of a Case.

Many lines of treatment of the infection itself have from time to time been suggested. Amongst these are the fixation abscess, "pure influenza" antigen, serum from convalescent cases, sodium salicylate intravenously (administered in 1/30 solution, 1 to 3 g. daily). Individual observers have praised these and other remedies, but none has received general support, whilst some have been definitely abandoned by those who previously advocated their use. At the present time various workers in Paris are testing the value of intra-thecal injections of a vaccine prepared from the central nervous system of rabbits infected by the virus which Levaditi obtained from the brain of a human case. The results are said to be encouraging, but they are still too few and uncertain to warrant undue optimism. In some of the cases so treated an undesirable meningeal reaction has occurred, and it seems doubtful whether repeated lumbar puncture in this disease may not itself be actually harmful. Some believe that it should be avoided if possible, and never performed in cases where the diagnosis is obvious; others, however, consider it is of therapeutic value in the relief of lethargy and other symptoms. Probably the most generally used drug, on theoretical grounds, is hexamine, given in full doses (10 gr. t.d.s.) over considerable periods, during which the urine should be examined daily for signs of irritation of the kidneys.

In the acute restless cases, with choreiform movements, careful nursing is essential. It is important to protect all parts liable to be chafed by the patient in his violent movements, since otherwise intractable sores may be produced on the elbows, knees, ankles, and elsewhere, even in a single night. Patients may at any time become extremely violent, and assistance should always be readily available. In some cases the use of a restraining sheet may be necessary. Sponging, ice-bags, or cold affusions to the head may be tried, the last-named being the most effective. (Tepid, cold, or even iced water is freely sponged over the head, face, and neck for about ten minutes every four hours. In males the hair should always be cut quite close; in females, only in very severe cases.) Sedatives in full doses are usually required. Bromides and chloral hydrate or chloretone, used alternately, have proved the most generally useful. If these fail, recourse must be had to an injection of hyoscine hydrobromide (gr. 1/200 to 1/100), which usually gives temporary relief. As a rule, this acute stage, if not fatal, diminishes in severity in a few days, sometimes with remarkable suddenness and independently of any particular treatment; this is a point to be borne in mind in assessing therapeutic values. In a few cases the maniacal symptoms may call for removal to a mental hospital in the interests of the patient.

Intense neuralgic pains in the head or elsewhere may occur at onset, and persist with extreme severity in spite of treatment. Drugs, such as antipyrin, phenacetin, aspirin, butyl chloral, gelsemium, bromides, &c., upon which reliance is usually placed in similar circumstances, often fail to produce any effect in these cases, and opium, in the form of Dover's powder, or morphine may be required from time to time. Myoclonic spasm may be extremely painful, and lead to great exhaustion and distress. Local pressure by pads and bandages, hot fomentations, and anodyne liniments are usually of little avail. Emplastrum sinapis applied to the epigastrium is occasionally useful. In severe cases morphine is required. The administration of an anæsthetic has at times been the only means of giving temporary relief. One or two observers claim success with injections of 10 c.cm. of the patient's own spinal fluid, but it must not be forgotten that the abdominal spasms which cause such acute pain when they first appear usually cease to be so painful after a few days, and that gradually the spasms may occur almost painlessly.

For the attacks of disordered breathing (polypnœa, dyspnœa, &c.), which often cause considerable alarm when they first occur, oxygen may be administered with good effect. In most cases a confident assurance to the patient and his friends that they are not dangerous and a simple sedative will suffice.

In the acute stage troublesome constipation often requires attention; frequent soap-and-water enemata may be useful. The tongue may remain foul and coated for longer than the general condition appears to warrant, when ordinary methods of local cleansing should be employed.

After-Treatment.

After-treatment may demand great patience and endurance. When once the acute stage is over, say in two to four weeks, there does not seem to be any necessity for complete rest in bed. Many cases remain weak both mentally and physically for very long periods, and require a long rest before returning to work. A sea voyage, a holiday abroad, a quiet retreat in the country, at the sea, or even at home, whatever course is decided on, must be designed as a real rest for the mind, and must therefore be congenial to the patient. In some cases motoring has proved effective.

The *Parkinsonian syndrome* as a sequela presents great difficulty in treatment. Massage, hydrotherapy, and passive movements have been advocated, and in some cases give a certain amount of relief. Electrical applications appear to give no benefit, and in some cases to do harm. Various drugs have been recommended, including arsenic, luminal, belladonna, and tincture of arnica. Scopolamine undoubtedly relieves the tremor and rigidity for a time, but has no permanent effect. Its use cannot be continued for long periods. After choreiform attacks recovery may be considerably hastened by the judicious employment of regulated exercises. For this purpose simple callisthenic arm exercises may be carried out, or, in small children, building with toy bricks. At the City Fever Hospital, Sheffield, Dr. Egerton Williams has obtained rapid improvement in older children by getting them to knit.

The most disturbing sequela is perhaps the peculiar nocturnal excitement and insomnia, which, though not limited to children, reaches its highest grade in them. In most cases much may be done by judicious control and "good mothering." Even then sedatives are often required as well. Of these, bromide and chloral hydrate, or chloretone seem to be the most generally useful. The method of injecting small quantities of milk intramuscularly, which was first suggested by Lust of Karlsruhe, has proved effective in many of our cases; 2 c.cm. of boiled milk are thus given at bedtime, and the child usually goes to sleep in an hour or two, and sleeps soundly for six or seven hours or more. Nor is its action limited to children. In the case of a man who had not been able to sleep until 3 or 4 o'clock in the morning since his acute attack five months ago, intramuscular injections of milk given at 9 o'clock each night for a week produced sound sleep from 10 till 5 next morning. Preliminary injections of distilled water in similar quantity at the same hour had failed to have any effect. It does not always succeed, but should be tried in any obstinate case. In some cases a change to the seaside or country, with plenty of exercise in the fresh air, will give temporary relief, but a relapse on returning to home conditions is not uncommon.

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Special Articles.

THE RESPONSIBILITIES OF THE M.A.B.

THE annual report[1] of the Metropolitan Asylums Board contains, as usual, a historical summary of the evolution of this great organisation and a clear account of the manifold duties it performs for the 28 parishes and unions which make up the Metropolitan Asylums district. To maintain this service, ratepayers at Hampstead combine with residents in unfashionable Wandsworth; Kensington in the West gets as efficient but no better service than does Limehouse in the East.

The Board is composed of 73 members, 55 being elected by the metropolitan boards of guardians and 18 being nominated by the Ministry of Health. Their duties include the provision and management of hospitals and other institutions for infectious diseases, tuberculosis, children suffering from specified contagious diseases and those requiring special treatment in general hospitals or convalescent homes, mental defectives and epileptics, training boys for sea service, and for casual poor; they also provide ambulance and transport services.

Of these activities the fever hospitals and the ambulance and transport service are best known to practitioners as being available for use by the public apart from Poor-law cases, but it is not generally realised how numerous are the contingencies affecting the public which the Board now has to meet. A list given in Appendix III. of the report divides the several classes of persons for whom the Board is now required to provide accommodation into (*a*) the mentally afflicted and epileptics, (*b*) the physically afflicted, (*c*) healthy classes, and this method of classification shows how wide are their responsibilities.

The Mentally Afflicted.

Harmless Poor-law imbeciles of any age, whether regarded as capable or incapable of improvement, have had to be provided for since the inception of the Board in 1867. Since this date also suitable cases certified under the Lunacy Acts transferred from the London County mental hospitals have been received. In 1897 the Board assumed charge of feeble-minded Poor-law children (uncertified), and in 1910 of sane epileptics (Poor-law). From 1917 cases certified under the Mental Deficiency Act, 1913, have been accepted.

It will be seen that during the last 50 years, by formal addition of new classes of persons and, perhaps, still more through freedom in the interpretation of the terms in which the original classes were defined, it has come about that the Board's purview of mental infirmity has extended so as to embrace a wide range of persons. No attempt is made to define the type of lunatic who may properly be detained in the mental hospitals provided by the Metropolitan Asylums Board, which by the Lunacy Act, 1890, are included under the definition of a workhouse.

In practice the Metropolitan Asylums Board now provides in its mental hospitals for: (*a*) Chronic and harmless cases of all forms of insanity; (*b*) idiots and imbeciles who come within the terms of the Lunacy Acts; (*c*) feeble-minded persons as approved by the Local Government Board in 1897 and 1911; (*d*) cases covered by the Mental Deficiency Act, 1913, with certain restrictions.

The distribution of the 9077 beds provided is as follows: Caterham Mental Hospital, 2109; Fountain Mental Hospital, 658; Leavesden Mental Hospital, 2209; Tooting Bec Mental Hospital, 1098; Darenth Training Colony, 2208; Edmonton Epileptic Colony, 355; Brentwood Institution, 350.

At the present time a scheme exists which aims at ensuring the classification of the different types of cases in suitable institutions and the regular movement through the institutions of patients according to changes in age and mental or physical condition,

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[1] Office of the Board, Victoria Embankment, London, E.C.4. Price 5s.

Thus, at the Fountain Mental Hospital are received all children under 7, unimprovable boys up to 9 years of age, and girls up to 16. The children under 7 are watched and classified so that when the time comes those who are thought to be trainable can be sent on to Darenth Training Colony. A few adult female working patients are maintained at the Fountain Mental Hospital. Tooting Bec Mental Hospital is the receiving home for all adult Lunacy Act cases sent by metropolitan boards of guardians, but no cases under the Mental Deficiency Act are received there. Aged patients are retained at Tooting Bec Mental Hospital. but younger ones. after observation. are transferred to the institutions for which they are suitable. Caterham Mental Hospital receives healthy unimprovable adults of both sexes and a certain number of low-grade trainable cases not up to standard for Darenth Training Colony. Caterham also has a large number of children's beds for unimprovable and low-grade trainable children. receiving the untrainable boys over 9 as they leave the Fountain Mental Hospital. Leavesden Mental Hospital may be regarded as an infirmary institution. It accommodates unimprovable adults of both sexes, chiefly those suffering from chronic infirmity not primarily due to old age.

The full statistical tables given of the work done in the mental hospitals present no features of special importance. Dr. G. B. Sherlock. chief medical officer of the Mental Hospitals Service. draws attention to the curious fact that among the 423 deaths recorded in patients who died at the ages of 45 and upwards during 1923. there were only 15 deaths attributed to cancer—i.e., 3·54 per cent. This is not a new feature, since the corresponding figures for the previous four years were 9, 7, 16. and 21 deaths from cancer. the total deaths being respectively 629. 472, 536, and 557. Dr. Sherlock points out that since most of the patients belong to London. a comparison with the Registrar-General's returns for that area is permissible. For 1923 the numbers were: Deaths from cancer (45 years and upwards), 5535; total deaths (45 years and upwards), 33.056, or 16·74 per cent. The reason for this marked difference between the figures for London and those for the Board's mental hospitals is not obvious.

The Physically Afflicted.

Infectious and Contagious Diseases.—The Board have 14 hospitals for infectious diseases, where they provide accommodation for cases of scarlet. enteric, or typhus fever, diphtheria. measles. whooping-cough. puerperal fever. cerebro-spinal fever, ophthalmia neonatorum. trench fever. malaria, and dysentery. All patients suffering from these maladies. whatever their status, are now receivable. Poor-law children suffering from ophthalmia or other contagious diseases of the eye are treated in an institution (White Oak, Swanley) which is a collection of groups of similar cottages. and serves the double purpose of hospital and school. There is room for 360 children, and Mr. E. Treacher Collins acts as visiting ophthalmic surgeon. During 1923 271 children were discharged cured. 240 were admitted; 101 from metropolitan and 22 from extra-metropolitan Poor-law schools, and 117 from London County Council schools. Apparently these are the only sources of admission, and since the reduction in the number of cases leaves vacant accommodation at this hospital, now partially used as a convalescent home. we suggest that the admission of patients from middle-class homes who attend private schools might be worth consideration by the Board. on the analogy of the reception of patients of this class into fever hospitals. Diseases of the skin or scalp in Poor-law children are treated at Goldie Leigh Homes, Abbey Wood: during the year 591 children were dealt with, the large majority suffering from ringworm, and here also the admission of the public other than those coming under the Poor-law might be greatly appreciated. A detailed account of the methods used at this home. giving a proportion of 487 cures out of 513 cases of ringworm. would be of interest. The Infectious Diseases section of the report, taking up 81 pages, is edited by Dr. F. Foord Caiger, chief medical officer of the infectious hospitals service, who besides contributing a note on the protective inoculation by the Schick test and active immunisation against diphtheria of the boys on the training ship *Exmouth*, makes observations on certain of the statistical tables. He calls attention to the lower incidence of scarlet fever and of diphtheria in London. and to the diminution of the death-rate of these diseases from 1·8 per cent. and 8·7 per cent. respectively in 1922 to 1·2 per cent. (scarlet fever) and 6·8 per cent. (diphtheria) in 1923. The last-named figure is still considered too high and could be materially reduced by the earlier administration of antitoxin. Incidentally in a note on the death-rate in diphtheria as influenced by the dosage of antitoxin. which forms one of 16 noteworthy contributions by medical officers to this section of the report. Dr. Margaret Björkegren observes that in so far as inference can be drawn from statistics in so complex a subject. the average optimum dose would seem to be about 20.000 units per patient. Dr. Caiger points out that the incidence of enteric fever is now so small that the disease has been omitted from the charts.

Owing to the low prevalence of scarlet fever it has been possible to devote more beds to the reception of measles and whooping-cough. 1767 cases of measles were admitted during the year with the very low case mortality of 7·7. The whooping-cough mortality, on the other hand, was high—14·6 per cent. of 528 cases admitted. The puerperal fever admissions during the year numbered 78, of whom 15 died. Sir Almroth Wright and his assistants are making trial of the immuno-transfusion[2] treatment on certain of the more severe cases of septic infections in three of the fever hospitals in coöperation with the medical officers, but the number of cases so treated is not yet sufficiently large to pronounce on its value.

Cases of mistaken diagnosis, that is to say, cases of diseases properly admissible into the fever hospitals in which, either at the time of their reception at the hospital. or as the result of subsequent observation, the diagnosis of the certifying practitioner was not confirmed, numbered 3527. The disease in respect of which a mistake in the diagnosis was most common was. as usual, enteric fever. The diagnosis of enteric fever was negatived in no less than 37·9 per cent. of cases so certified, the diseases most often mistaken for enteric fever being pyrexia of unknown origin, pneumonia. enteritis, influenza, and meningitis. Diphtheria comes next with 20·9 per cent. (the figure for 1922 was 14·1), mistakes being most frequent in respect of tonsillitis, laryngitis, and Vincent's angina.

Research into problems connected with scarlet fever is being actively pursued in the Belmont Laboratories by the research pathologist to the Board, Dr. W. Mair, who contributes to this report an article on the ætiology of scarlet fever.

Tuberculosis.—The section of the report devoted to tuberculosis deals with the arrangements made for cases (*a*) of pulmonary tuberculosis, (*b*) of non-pulmonary tuberculosis. The Board has entered into arrangements with the London County Council under which they provide residential treatment for tuberculous patients in the County of London. The institutions for adult patients under their control include two sanatoriums for early cases of pulmonary tuberculosis, three hospitals for advanced cases, and one hospital for surgical tuberculosis. For children suffering from tuberculosis three institutions have been provided—two at the seaside and one in the country. Provision has been made in all for 1000 adults and about 1200 children.

Dr. James Watt, the chief medical officer of the Medical Tuberculosis Service, commenting on the statistics for pulmonary tuberculosis, pleads for more beds for advanced cases, since continued voluntary segregation would, in his opinion, do much to prevent the spread of infection. With regard to the ultimate result of treatment, as measured by the proportion of cases surviving four to five years after discharge from the sanatorium, Dr. Watt states that a misleading impression has been fostered that in general all the negative cases do well and all the positive cases do badly. The statistics of the London County Council show that only about 30 per cent. of the positive cases survive for four to five years, while about 70 per cent. of the negative class are alive at the end of that period. But it is clear from the figures given that although the prognosis is good where the lung lesion is slight, and there is not much deterioration of the general health, yet even in the negative class, where the lesion is extensive and the general health considerably affected, the issue hangs in the balance. There is a good case therefore for giving as thorough and as prolonged treatment to patients of the negative as of the positive class. A certain proportion of the former are so little deranged in health that a short period of treatment and education may suffice; but on the other hand a considerable proportion of the positive class have so little prospect of recovery, even with prolonged sanatorium treatment, that the latter is wasted on them, and could be replaced by less expensive methods of teaching the rules of healthy living.

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[2] See THE LANCET, 1923, ii., 1341.

The section of the report devoted to non-pulmonary tuberculosis, which service is under the general direction of Dr. W. T. Gordon Pugh, includes a description of Princess Mary's Hospital for Children at Margate, which has 271 beds and excellent educational facilities. Six signed articles on special points by medical officers of the tuberculosis service of the Board are appended.

Other Diseases.—Poor-law children requiring seaside air or special treatment in a hospital or convalescent home are well served. Queen Mary's Hospital, Carshalton (900 beds), and The Downs Hospital, Sutton (360 beds), take all sorts of cases. St. Anne's Home, Herne Bay, provides 15 beds at a seaside convalescent home, supplemented by beds at White Oak, Swanley.

The section of the report dealing with children includes a lengthy and copiously illustrated monograph on the Conservative Mastoid Operation and its Objects, by Mr. Charles J. Heath, consulting aural surgeon to the Downs Hospital for Children.

Venereal Diseases.—The treatment of venereal diseases at the Sheffield-street Hospital has been continued during the year; 121 women, 7 of whom had babies with them, were admitted to the hospital, while 21 babies were born in hospital. At the Thavies Inn Institution for parturient women suffering from venereal diseases, Mr. John Adams records a diminution in the number of cases of syphilis and believes that this decrease is likely to continue. During the year under review 12 mothers were admitted with syphilis, 10 infants were born alive, 6 with positive and 4 with negative W.R. As to the two stillborn fœtuses, one mother was admitted in labour and the other was confined seven days after admission, neither having had previous treatment. At St. Margaret's Hospital for ophthalmia neonatorum, where mothers may be admitted with infants, 164 women and 225 infants were admitted during the year. Dr. Doris M. Howard records that 203 infants were discharged with sight unimpaired, 19 with sight impaired in one or both eyes, and 3 blind in one eye. The hospital now undertakes the treatment of venereal disease in the mothers admitted with their babies, with good results. This hospital is not confined to Poor-law cases.

Healthy Classes.

Since 1875 the Board have received Poor-law boys for training for sea service (including many received from extra-metropolitan parishes and unions), and since 1911 they have had to deal with the "casual poor." The number of boys admitted to the training ship *Exmouth* during the year was 290. Of the boys discharged, 45 entered the Royal Navy, 153 the Mercantile Marine, and 21 were drafted into the Army as musicians. With a view to increasing the physical standards of the boys, the dietary scale on the ship has been improved by the addition of more milk and the introduction of greater variety in farinaceous foods and dried fruits. The question of a further revision of the scale is under consideration. As to the casual wards, one of the seven in use during 1922 has been closed and used as a hostel for men, carefully selected from the casual wards or from the night office, who are likely to find work.

The length of stay in the hostel is ordinarily limited to 14 days. The inmates are given a more liberal diet than is provided in the casual ward; are subject only to such regulations as are necessary for the proper conduct of the institution; and are allowed complete liberty to seek work, with the result that many situations have been found by the men. The likelihood of response to the assistance which they would be given was the sole factor in the selection of the cases, as is illustrated by the fact that the men were drawn from over 70 trades. Of the 471 cases admitted to the hostel during the first six months, 130 were known to have found employment, of whom only 15 subsequently returned to the casual wards.

The Board has approved the continuation of this apparently excellent scheme for the full period of one year for which it has been sanctioned by the Ministry of Health.

THE MILK PROBLEM AND THE MINISTRY OF HEALTH.*

The fresh milk consumed in this country is for all practical purposes entirely home produced, in this respect differing from all our other food-supplies. There are over 2½ million dairy cattle in the country, and of these nearly 2 million are actually producing milk. The yield of milk during 1923 was 1150 million gallons, and of this the amount consumed as fresh milk was 730 million gallons. When it is remembered that some 2 per cent. of the milking cows are yielding milk containing tubercle bacilli; that much of the milk distributed for consumption as such is produced under extremely unhygienic conditions and is liable in course of production, handling, and distribution to gross contamination by dirt derived from varied sources; that such milk may be consumed by young infants, delicate children, and invalids; and that even where milk is treated by heat the process employed is rarely capable of destroying disease-producing organisms, it is abundantly clear that there exists a formidable milk problem bearing directly on the health of the community.

Importance of Milk as a Food.

In view of the great value of milk as a staple article of food, especially for the young, Sir George Newman unhesitatingly lays down that the consumption of milk ought to be much greater than it is at present. It has been estimated that the average consumption per head of our population per day amounts to no more than a quarter of a pint. This is less than half the quantity consumed in most other countries, notably in America, and it indicates that there must be a grave deficiency in the amount of milk at present consumed during the early years of their lives by the bulk of the children in this country.

The milk problem as it stands to-day presents two aspects. First, the consumer must be protected as far as possible from risk of infection by disease, especially tuberculosis, and his milk must have a satisfactory, unadulterated, nutritive value; and second, in order to increase consumption, it is necessary that milk should be attractive and appetising, of good keeping qualities, and of recognised economic value. The question of protecting the consumer resolves itself into eliminating tuberculosis from the milking herd and in protecting the milk from contamination by human and other infections, and to this end the Milk and Dairies (Consolidation) Act is designed, in conjunction with the Tuberculosis Order. As a second line of defence stands the Food and Drugs Act, and finally the pasteurisation of milk. The key to ensuring good keeping qualities in milk lies in its efficient handling from the cow to the consumer.[1]

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* Abridged from a section of the Annual Report of the Chief Medical Officer of the Ministry of Health for 1923. London: H.M. Stationery Office.

A supplementary method of raising the standard quality of milk and of educating both the producer and the consumer has been introduced in the new method of *grading* higher quality milk to be sold under special designations. The system has been introduced and maintained mainly to afford a working example of how milk can be made reasonably safe and attractive. It has had notable success in this respect, and is the parent of a growing movement amongst farmers for improving their methods. Nearly every county in England is now organising "clean milk competitions" on the basis of the Ministry's grading requirements, and the indirect educational value is unquestioned. The value of a bacteriological standard as a means of judging of the purity of milk has for many years been demonstrated in the United States, and although the method has been employed in practice in this country only during the past three or four years and on the very small scale provided by the graded milks, it has, however, sufficed to initiate a movement in the desired direction, and already the influence of and appeal to the bacterial standard shows evidence of extending far beyond the limited field at present covered by graded milks. But direct education of public opinion is also necessary. A wealthy and influential organisation representative of the trade, agricultural and public health interests, the Milk Publicity Council, already exists. Its objects are to bring about an increase in the demand for milk. It advocates the provision of a good and acceptable article as the essential basis of the success of its aims. It realises that the consumer has hitherto been suspicious of, and dissatisfied with, the quality of the supply. Ordinary milk is suspected of being a cause of disease, and its frequent premature souring is a source of loss and annoyance. In consequence condensed and dried milk, although much more expensive, have been largely substituted. It should only be a matter of time and the development of some decided interest on the part of the consuming public, says Sir George Newman, before definite standards of cleanliness and purity can be insisted on for the whole of the milk-supply.

General Methods of Milk Control.

When opportunity offered the medical officers and milk inspectors of the Ministry have made inquiries into matters relating to general milk production and have conferred with medical officers of health and sanitary inspectors on questions of local administration of regulations to ensure a clean and wholesome milk-supply made under the Dairies, Cowsheds and Milk-Shops Orders. As a result it was found that there was much scope for improvement in the quality and uniformity of administration of these regulations by local authorities in all parts of the country, and, as Sir George Newman states, it is idle to complain of the milk-supply if authorities neglect to exercise the powers they possess.

Sources of Contamination.—The chief sources of contamination are the udder and teats of the cow itself, the hands of the milker, the air, and the utensils and vessels in which the milk is collected and transported, and the principles underlying the maintenance of cleanliness are extremely simple. The regulations include the cleansing of milk vessels by steam or clean boiling water, the cleanliness of the udder and teats of the cows, and the thorough cleansing of the hands of the milkers. With the addition of adequate cooling it would be quite possible for the producer to comply with any ordinary bacterial standard which is likely to be set up for determining cleanliness in milk.

The System of Inspection.—Enforcement of those sections of the regulations dealing with cleanliness of procedure can only be secured by a well-planned system of inspection, which would include admonitory notification, followed by legal proceedings under the regulations where the failure complained of was continued. Useful work on these lines is being carried out by some local authorities, principally in urban districts. In many of the rural districts, however, owing to largeness of the areas concerned, inadequacy of the sanitary staff and indifference to such matters on the part of local councils, little or no control of any kind is exercised over the production of milk. In consequence there is a growing tendency of the larger urban centres to seek means for their own protection in regard to milk-supplies. In the United States this is the method invariably employed by the larger cities. Inspection of farms for this purpose by the city inspectors involves long journeys over wide areas. The need for such journeys is in many cases reduced considerably as a consequence of establishing a bacterial standard of purity for milk coming into the city.

The proper use of existing powers under the regulations would be strongly reinforced in this respect by the prospect for the producer: (*a*) of obtaining a better price for a better article, or (*b*) by the need for him to comply with a bacteriological standard. At the present time much of the milk collected from adjacent farms at country depôts for conveyance by the large distributing companies to urban centres is so grossly contaminated at the farm that immediately on its arrival at the depôt, often while it is still warm from the cow, it has to be put through a process of "cleaning" (i.e., straining or centrifuging), followed by pasteurisation and cooling, before it can with safety be despatched by rail to its destination. This elaborate attempt to remove from milk, dirt, which the simplest precautions taken by the producer would have excluded, adds considerably to the cost of distribution. Yet the careful producer, whose milk calls for no such treatment, seldom finds himself better off as regards the price he receives for his product than one whose milk cannot be trusted to remain sweet for a few hours without this costly special treatment. There is obviously scope here for adjustment by the trade which could not fail to benefit producers, distributors, and consumers alike.

Milk Grading.

The Milk (Special Designations) Order, 1923, came into operation during the year. The Order was designed to place on a permanent footing the system of milk grading which was developed during the war and carried out for some years under temporary orders derived from war emergency legislation. The new Order, made under the Milk and Dairies (Amendment) Act, 1922, enlarges somewhat the previously existing scheme of grading by adding a new grade in which the tuberculin test for cattle is not required, and by reserving for the term "pasteurised" as applied to milk the significance of a special process carried out under prescribed conditions. The various grades now established by the Order may be summarised as follows:—

1. *Certified Milk* must be produced from cows which have passed a prescribed tuberculin test and veterinary examination. The whole herd must be submitted to the test and veterinary examination at intervals of six months, and every animal added to the herd must be tested immediately before admission. The milk must be bottled on the farm and must not at any time contain more than 30,000 organisms per c.cm. or any coliform organisms in 0·1 c.cm.

2. *Grade A (Tuberculin Tested) Milk* is subject to the same conditions as certified milk as regards the testing and examination of cattle. The milk must be bottled before distribution and must not at any time contain more than 200,000 organisms per c.cm. or any coliform organisms in 0·01 c.cm.

3. *Grade A Milk* must satisfy the same conditions as Grade A (Tuberculin Tested) Milk, with the exception that the tuberculin test is not required and that veterinary examinations of the cows in the herd are made at intervals of three months instead of six months.

4. *Pasteurised Milk* is milk which has been pasteurised by the holder process as defined in the Order—i.e., it must be held at a temperature of 145° to 150° F. for at least half an hour and then cooled to 55° F. It must not be heated more than once and it must not contain more than 100,000

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[1] Cf. THE LANCET, August 16th, 1924, p. 330.

organisms per c.cm. If the milk so treated is Grade A milk the number of organisms must not exceed 30,000 per c.cm. and there must be no coliform organisms in 0·1 c.cm. Pasteurisation or heating of Certified or Grade A (Tuberculin Tested) Milk is not allowed.

The number of licensed producers controlled directly by the Ministry at the end of 1923 was 101, an increase of 60 per cent. on the number holding licences at the end of the previous year. During the year 14 new licences for the production of Certified and 24 for Grade A (Tuberculin Tested) were issued, and none was revoked on account of failure to comply with the Order.

Visits by the Ministry's milk inspectors were made to all farms in respect of which licences had been issued directly from the department, and each farm was inspected, on an average, once every six months. Before a new licence is issued the farm of each applicant is inspected and a report made on the special score card which has been adopted by the department. This includes a survey of equipment, methods of production, identification of animals in the herd and checking records of the herd, and of the production and sale of milk.

Records kept in the department indicate that at the end of 1923 approximately 4000 animals were included in those licensed herds for which a tuberculin test is prescribed by the Order (2200 on "Certified" farms and 1800 on "Grade A (Tuberculin Tested)" farms). The milk of these grades produced during the year amounted approximately to 6000 gallons daily.

Bacteriological Examination.

Samples of milk taken for this purpose are now in all cases obtained by officers of the various local authorities in whose districts the milk is sold and are despatched by them to the bacteriological laboratory with which the local authority, with the approval of the Ministry, has arranged for the examination of these samples. The reports indicate in general a very high standard of achievement on the part of the producers concerned. In 1923, 83·4 per cent. of the samples examined were within the limits prescribed by the Order, compared with 76 per cent. in 1922, 71·8 per cent. in 1921, and 69·7 per cent. in 1920. Copies of the bacteriologist's report are in all cases sent to the producer, his attention being drawn, where necessary, to any departure from the prescribed limits. Where such has occurred a second sample is taken shortly afterwards, and if necessary a third. It is seldom, however, that the cause of failure has not been removed by the time a second sample is taken. The disclosure which the bacteriological method of control inevitably makes of failure to observe any of the essential details of clean milk production, as well as the general accuracy and fairness of the method are understood and appreciated by producers and others engaged in the trade.

Under the new Order the conditions required in connexion with the tuberculin testing of licensed herds have been revised in some particulars. These include re-tests at six-monthly intervals by the combined subcutaneous and ophthalmic methods and involve the taking of two additional pre-inoculation temperatures and one additional post-inoculation temperature at the sixth hour. These modifications were made on the recommendation of the Tuberculin Committee of the Medical Research Council, whose earlier work in the investigation of this test as applied to cattle strongly indicated the desirability of adopting these modifications. The work of this Committee has continued throughout the year, and the department is indebted to its members and especially to its chairman, Captain S. R. Douglas, for much very helpful coöperation in dealing with the many problems which have arisen in connexion with the application of the tests. It is hoped that the ultimate outcome of the Tuberculin Committee's work will be to simplify and standardise these tests and at the same time enhance their reliability and value as a diagnostic method.

The sale of stock advertised as having passed the tuberculin test appears to be on the increase. The tests in question have not always been carried out in accordance with the requirements of the Order, and licensed producers buying such animals at auction sales have been faced with the difficulty that the certificates are not accepted by the Ministry. Before adding such animals to the licensed herds licensees have been obliged to submit them to a special test which has been devised to meet such cases, but this involves additional expense, trouble, and loss of time to the producer, and it would obviously be desirable in the interests of all concerned if the Ministry's requirements in regard to the application of the test were observed in the case of cows offered for sale at auction as having passed a tuberculin test.

Pasteurisation.

It is too early for useful comment on what has been done under the Order in connexion with the use of the special process of pasteurisation for milk there defined. Manufacturers of dairy appliances have manifested considerable activity and ingenuity in devising apparatus which would enable the process to be carried out strictly in accordance with the requirements of the Order. Dr. Hamill's "Notes"[2] give a brief account of the nature and object of pasteurisation and the part which it may legitimately play in securing a safe and satisfactory milk-supply. They are also intended to serve as a guide to local authorities and others in respect of essential requirements in the design and construction of pasteurising appliances, which should be complied with in order to satisfy the provisions of the Order in regard to pasteurised milk.

The Handling of Milk.

Inquiries into the conditions under which milk is handled during transport are being carried out by the Ministry, and observations in regard to this matter are being made at the present time at the principal London railway stations. Special attention is also being given to bottling of milk. The very general practice of delivering milk from door to door in small cans filled as required from churns carried on a cart or barrow has objections owing to the contamination which the milk may receive from splashings, dust, and other inevitable pollutions from the street, and from the hands of the roundsman, who, besides handling the milk, has to drive a horse or push a barrow. The obvious nature of these objections has for long been recognised, and the delivery of milk in suitable bottles (sterilised by steam, filled under hygienic conditions in a properly conducted dairy and securely sealed) will afford adequate protection against any further contamination of the milk, not only in course of delivery, but also in the household up to the moment of its actual consumption.

The public have begun to realise the advantages which bottled milk should possess, and the demand for it is increasing. This demand is unfortunately being widely exploited by the less scrupulous section of the milk trade. Instead of the milk being bottled under strictly hygienic conditions at a proper dairy it is very frequently bottled by the roundsman in the street. A bottle which has been carried on the cart exposed to the dust of the street, or perhaps collected as an "empty" from a neighbouring customer, is filled at the tap of the churn, fitted with a cardboard disc taken by the roundsman from his pocket, or where several bottles have to be covered at the same time, from a store of discs held between his teeth, and presented to the unsuspecting customer as "Nursery Milk" or milk of some other fanciful designation of the kind. For this the consumer confidingly pays an extra price, although milk so handled is in reality much less safe than milk delivered in ordinary cans. Powers for prohibiting practices of this kind will be available when the Milk and Dairies (Consolidation) Act comes into operation in the autumn of 1925. In the meantime consumers should satisfy themselves beforehand that bottled milk has really been bottled in a proper manner.

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[2] Reports on Public Health and Medical Subjects, No. 17. Notes on the Pasteurisation of Milk, by Dr. J. M. Hamill.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Medical and Pharmaceutical Advertisements.

A MOTION was laid before the Chamber of Deputies with regard to the prohibition of publicly advertising medical treatment or pharmaceutical preparations. This motion is designed to protect the public health which is threatened by the advertisements of those who claim to cure rheumatism, hernias, tuberculosis, and syphilis, and to combat the publication of announcements so worded as to induce readers to believe that they can dispense with proper medical care. The motion is particularly directed against proprietary medicines the ingredients of which the makers will not disclose in spite of the law against secret remedies, and aims at suppressing medicines accompanied by instructions for self-treatment by the purchaser, which involves transgress of the law dealing with illegal medical and pharmaceutical practice. The motion contains a unique clause which runs as follows: "From the date that this law comes into force, all publicity carried out by means of the press, by posters or otherwise, to further the medical or pharmaceutical treatment (excepting such advertisements in scientific journals published on behalf of the medical profession) will be punishable by imprisonment from five days to a month, and by a fine of 500 to 3000 francs, or by one of these penalties alone. Where the offence is repeated the punishment will be doubled."

A Proposed Sanatorium for Tuberculous Students.

The Section of Medicine of the Association Générale des Étudiants has given consideration to the question of tuberculous students in France, and now proposes to establish a sanatorium on the lines adopted by certain other industrial and university societies for their members, as, for example, the Metallurgic and Miners' Society. The site of the proposed sanatorium lies on the plateau of Petites Roches, at an altitude of 1100 metres, some 18 kilometres from Grenoble. The plans provide for a basement, a ground floor, and three upper storeys. The third storey will be erected only over the central portion of the building, and the kitchen will be situated apart from the house. In layout the sanatorium will be fan-shaped, two wings forming an open angle with the central portion, which will face south, an open gallery on the southern side will run the whole length of the ground-floor. There will be accommodation for 103 beds divided among 32 rooms each containing two beds, the other rooms being used for isolation cases. A certain number of beds will be reserved for cases of bone tuberculosis and for women students. A games room, a library, and experimental laboratories are included in the plans. The State has granted to the Association the sum of 1,300,000 francs towards the cost of establishing the sanatorium, the total expenses of which are estimated to be double that amount.

Infant Welfare Propaganda.

The Prefect of the Seine recently brought before the Academy of Medicine a proposal to publish a brochure on infant welfare, for distribution amongst the mothers of the community. The Academy, however, was of the opinion that such a pamphlet would have no greater efficacy than the health instruction posters already exhibited in many places, and that to further the cause of infant welfare the best method would be to increase the number of such posters, rather than to publish more detailed instructions in the form of a brochure.

A New Doctorate.

The diploma of "Veterinary Doctor" was established by law a year ago and the conditions under which this title of doctor may be granted to those who hold the ordinary veterinary diploma have recently been determined. The students of the National Veterinary Schools of Alfort (near Lyons), Paris, and Toulouse must submit a printed thesis to the Faculty of Medicine at their respective schools. The examining body will consist of three members, a professor of the Faculty of Medicine as president and two professors from the veterinary school. In future every veterinary student must qualify with the Diploma of Veterinary Doctor. Veterinary practitioners, under the old scheme, may obtain the new title by submitting a thesis, or in lieu, by showing a satisfactory record of previous work. Professors and former professors of the National Veterinary Schools will receive the diploma of doctor without submitting a thesis.

The "Journées Médicales" at Toulouse.

The success which has attended the Journées médicales of Brussels, which have been held annually during the last four years, incited the medical men of Toulouse to hold a similar type of local conference. These journées médicales differ from the usual congress or conference in that they are designed purely for local practitioners who cannot spare much time away from their practices, with the object of passing under review most of the problems which are of topical scientific and professional interest. Last month, therefore, Dr. Bardier, professor of experimental medicine at the University of Toulouse, assisted by the Dean, Dr. Abelous, organised with great success journées held on four days and attended by some 650 medical men. Every morning the members were given a detailed programme of the various clinical meetings, medical and surgical, that were being held in the various hospitals. In the afternoons conferences were held at the Faculty of Medicine. Among the communications made I might mention those of Dr. Vincent, Medical Inspector-General, on the colon *bacillus* as a pathogenic agent, on vaccinotherapy, and on the methods employed during the war to combat typhoid fever, gas gangrene, dysentery, and cholera. There was a full exhibition of field laboratory and hospital equipment. Dr. Gley, of the Collège de France, read a paper on the problem of old age and the doctrine of the glands of internal secretion; Dr. Bézy spoke on infant welfare in its sociological aspect; and Dr. Beckers, who represented the Belgian Government, dealt with recent advances in the treatment of cancer of the breast. Medical politics were fully discussed, among the speakers being Dr. Decourt, president of the Union of Medical Syndicates, and Dr. Bellencontre, president of the General Association of French Doctors. Apart from the consideration of scientific and professional questions, a pleasant programme of excursions was carried out and a visit was paid to the thermal establishment at Luchon.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

Rejection of an Antivivisection Bill.

AFTER the plebiscite in the canton of Basle-Land of August 17th, throwing open medical practice to "homœopaths and herbalists," one had every reason to look forward with grave misgivings to the popular vote in the canton of Zurich of August 31st. A Bill had been brought forward, drafted by a local dentist and supported by some 20,000 citizens, which provided for the complete prohibition of vivisection—operations on animals performed by veterinary surgeons or by farmers for breeding purposes being excepted. Since in the canton of Zurich there existed strict legal provisions regulating vivisection in scientific institutes, it was difficult to see what other object the promoters of the Antivivisection Bill had in view than an attack on medical science generally. In the Cantonal Parliament of Zurich the popular Draft Bill only found one friend who in his speech called the abolition of vivisection "the realisation of a religious and civilising claim," and who could not understand why intelligent animals should have to give their life "in order to cure unreasonable men who had ruined their health by vice and passion." In the campaign preceding the vote organisms per c.cm. If the milk so treated is Grade A milk the number of organisms must not exceed 30,000 per c.cm. and there must be no coliform organisms in 0·1 c.cm. Pasteurisation or heating of Certified or Grade A (Tuberculin Tested) Milk is not allowed.

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Pasteurisation.

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The Handling of Milk.

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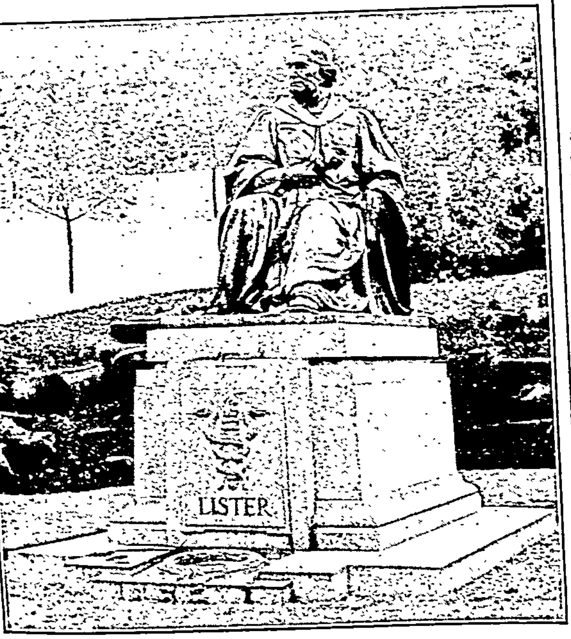
GLASGOW MEMORIAL TO LORD LISTER.

THE movement to commemorate the great services of Lord Lister in the city in which he made, and put into practice, the discoveries which have done so much for the alleviation of human suffering, originated as far back as February, 1912, when a committee of citizens was appointed to promote the memorial and obtain the subscriptions therefor, but owing to the war the prosecution of the scheme was interrupted. The appeal for funds was most generously responded to, and the scheme generally met with the most unqualified approval. Subscriptions were received from individuals and scientific societies in this country and abroad. Various suggestions were made as to the most fitting manner in which Lord Lister's memory should be commemorated. One of the proposals which received almost universal support was the preservation of the old "Lister Ward" in the Glasgow Royal Infirmary, with the idea of making the ward a medical museum not only for the housing of personal relics of Lord Lister and of his period, but also to demonstrate the evolution of the science and art of surgery since his day. However, the managers of the Royal Infirmary declined to entertain the proposal and caused the historic ward to be demolished, notwithstanding widespread protest not only from the citizens of Glasgow but from scientific men and scientific bodies all over the world. In the course of their labours the committee collected—largely through the personal efforts and enthusiasm of Mr. A. E. Maylard, who until recently was the senior surgeon of the Glasgow Victoria Infirmary—a number of valuable objects of interest and other relics relating to the life and period of Lord Lister, including several portraits of him; photographs of the houses and institutions with which he was connected; several documents and autograph papers; his robe, hoods, and trencher; a hundred of his books; models of old operating tables and various instruments; specimens of the dressings used by Lord Lister; examples of sprays and other apparatus which belonged to Lord Lister, and various pieces of old furniture. This collection is at present being temporarily housed in the Pathological Department of the Royal Infirmary.

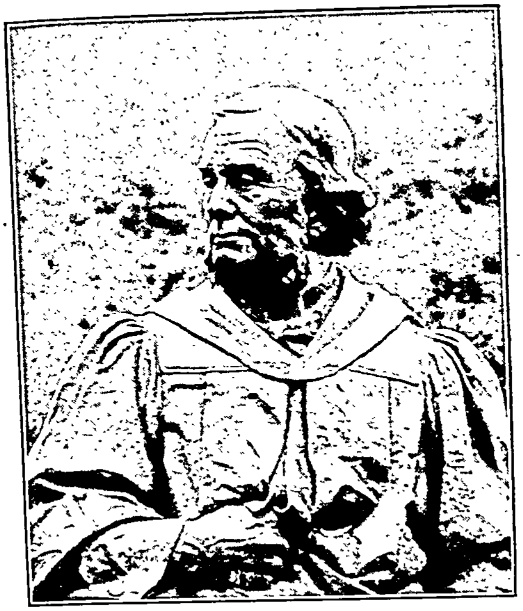
FIG. 1.



STATUE IN KELVINGROVE PARK.

When the Memorial Committee realised that the decision of the directors of the Royal Infirmary to demolish the ward was irrevocable it was decided to apply the funds at the committee's disposal to the erection of a statue of Lord Lister to be placed in the Kelvingrove Park, immediately below the University of Glasgow, of which he was at one time so distingusihed an ornament, and on a site adjacent to the one occupied by a similar statue of his old contemporary and colleague, Lord Kelvin. This statue, designed by Mr. Paulin, A.R.S.A., which shows Lister in his robes, seated, was unveiled on Sept. 17th by Sir Hector C. Cameron, emeritus professor of surgery in the University of Glasgow, and one of the last survivors of Lord Lister's house-surgeons and assistants. No more appropriate choice could have been made than of one who throughout his life retained the affection and regard of his great master.

FIG. 2.



LORD LISTER.

In the course of his speech Sir Hector Cameron gave an interesting account of the surgery class in the University of Glasgow in 1862, when Lister was professor. "One of my fellow students," he said, "was Frederick Trendelenburg. Some years ago, in a letter which I received from him, he observed that, while we all regarded Prof. Lister with great respect and admiration, none of us could foresee that he would one day 'change surgery from the very bottom.' This was a just remark. All of us, indeed, felt conscious that we were listening to new and valuable lessons not yet in print, but little realised how great their value was or what unspeakable blessings were to flow from their development in the near future. It was not, however, until 1865 that Lister began to develop his antiseptic system of wound treatment. His subsequent achievements were not accomplished without indomitable perseverance and a marvellous patience in the face of great opposition from the majority of the leaders of his profession, especially in his own country. From the very first he was under no illusion in regard to the inevitable and hostile criticism which his doctrines must evoke, especially from those who were prejudiced by a life-long familiarity with the older teaching and the former methods of practice. Years later Lister said on one occasion that no demagogic device was spared to attack the legitimate methods of medical science; the anti-vivisection propagandists widely used sensational illustrations. The electorate of Zurich kept a cool head and rejected the Bill with 62,641 votes against 27,793.

The Epidemic of Mild Small-pox.

The epidemic of small-pox in Switzerland which began early in 1921 has not yet subsided. According to the annual report of the Federal Health Office in 1923, 2145 cases were notified in 1923 and 1159 cases in 1922. Small-pox here has maintained the same mildness of type as observed in the epidemic in England; so far only one death, that of an enfeebled man of 69, has been reported. Investigation into the state of vaccination amongst the small-pox patients has shown that of the 2145 cases in 1923 1791 had never been vaccinated. The epidemic is practically confined to the German-speaking cantons. This is easily explained by the fact that in the French and Italian-speaking cantons vaccination is compulsory, and the law is strictly enforced. The present epidemic puts a heavy financial burden on the country; in the last two years over a million francs (£40,000) have been spent in isolation of cases, disinfection, and transport.

Medical Study.

The number of candidates for the federal medical examinations begins to show a slight decline. In 1923 223 candidates presented themselves for the first and second examinations and 180 for the final examinations, the corresponding numbers for 1922 having been 243 and 196. This decline is welcome, although the danger of overcrowding of the profession still exists, as an annual increment of 180 qualified practitioners is far above the demand in our small country. A post-graduate course for public health officers and police surgeons, arranged by the medical faculty, will be held at Basle from Oct. 1st to 21st. Amongst the subjects which are treated by prominent Swiss scientists may be mentioned sickness and accident insurance, school and industrial hygiene, organisation of first-aid stations, regulation of midwives, food control, anthropometry, forensic medicine, modern methods of combating epidemics, and venereal disease. Apart from the lectures the sanitary institutions of the town and some industrial works will be visited. The course is open to all medical men. No fee is charged. Intending participators should apply to Prof. Doerr, Institute of Hygiene, Basle.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Death of Prof. August Reuss.

A FEW days ago the senior of our ophthalmic surgeons, Prof. Dr. August Reuss, passed away at the age of 83 years. He was a descendant of a well-known medical family, and his son is professor of pediatrics in Vienna University. As a young man Prof. Reuss took up the study of botany, but he soon turned his attention to medicine, and became assistant of Arlt. He worked chiefly on the purely optic side of ophthalmology, and contributed valuable papers and books on colour-blindness, on the visual field in functional diseases of the nervous system, and on the hygiene of schools from the standpoint of the eye specialist. For a short time he was director of the Eye Clinic in Vienna, when Stellwag and Mauthner passed away in rapid succession. Then he founded the "Poliklinik," an institute that, under his energetic management, succeeded in becoming a second "general hospital" and almost a second University, for all the subjects of the medical student's curriculum—except anatomy—were taught at the "Poliklinik" by most competent men. In fact, an appointment to a professorship at this institute was, and is still, regarded as the last step before being called to a chair at the Vienna University. The deceased was the recipient of numerous honours during his long life, and honorary member of nearly all the ophthalmic societies of Europe.

Privileges for Doctors' Cars in Street Traffic.

In a memorandum to the Ministry of Commerce (which controls the traffic and transport here) the Medical Union demands that cars owned or run by doctors in the course of their medical work should be allowed to exceed the speed limit with impunity. This privilege is accorded only to the public first-aid ambulance and the fire-brigade, and at present the police controlling the street traffic give a certain preference to motor-cars showing the word "Arzt" (medical man) across the front. But the medical men demand to be treated on the same lines as the other two above-mentioned groups, because the urgent calls of a doctor are of equal importance. It is believed that within a short time the preferential treatment of most professional calls will be conceded by the police.

Athletes' Hearts.

The institute known as "Herzstation" (department for study of the diseases of the heart) has organised a regular examination of the hearts of individuals devoting themselves to gymnastic or athletic sports. For the last two years all the prominent members of our leading football, swimming, and boxing clubs have been examined at regular intervals, also before and after special feats, and exact records taken, including X ray photos, electro-cardiograms, and the results of functional tests. Besides, about 4500 individuals of both sexes, of ages between 14 and 36, engaged in more or less active muscular exercise, have been examined in this institute and the observations obtained thus are kept for comparison at later periods, when these individuals come back for re-examination. Valuable knowledge was obtained in this way and formed the basis of a book published by Dr. Kauf, dealing with the sporting man's heart. It is now intended to send for examination all children of 14 or over who frequent the higher schools before permitting them to take up athletics.

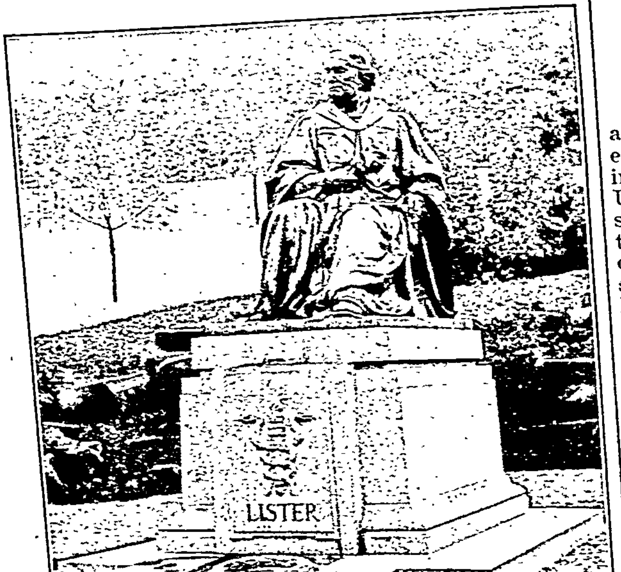
BELFAST MENTAL HOSPITAL.

THE annual report of the Belfast Mental Hospital for the year 1923 shows that the number of patients under treatment during the year was 997—males 480, females 517. The most prevalent form of mental disorder was melancholia —22·5 per cent. (15 males and 37 females), followed next by primary dementia, 16·4 per cent. (29 males and 9 females). General paralysis was represented by 28 males and 7 females, an increase of 20 over the previous year. Eight males and five females were cases of congenital mental deficiency. One hundred and forty-two patients were discharged; of these 88 were recovered, the recovery-rate to the total number of admissions being 38·1 per cent. This rate remains about the same as in previous years. The deaths were 71 (33 males and 38 females). The chief causes of death were general paralysis, which accounted for 22·5 per cent., cerebral softening with 16·9 per cent., and phthisis with 15·4 per cent. The chief causes of mental disorder were found to be morbid heredity, mental stress, the critical periods, and syphilis. In 4·3 per cent. of the admissions alcoholic excess was considered the principal cause of insanity, and in 9·5 per cent. it was believed to be a contributory cause. The treatment of general paralysis of the insane by the induction of malarial fever was commenced late in the year. Benefit has accrued in certain cases, but the medical superintendent, Dr. S. J. Graham, thinks it premature to decide whether the improvement will be permanent. Dr. Graham urges the necessity for fresh lunacy legislation in order to deal effectively with prevention and the incipient stages of mental disease. He urges that "it seems pitiable that one of the worst forms of disease should be denied skilled early treatment, and that it is not until the mental symptoms have developed so far as to render the individual unfit to be at large does treatment commence, following certification and its present-day attendant stigma." This matter has already been brought officially under the notice of the Government of Northern Ireland, and it is hoped that the necessary legislation will not be long delayed. The committee of the hospital has already arranged for the erection of a reception villa for incipient cases, which may hereafter be admitted as voluntary or uncertified patients.

GLASGOW MEMORIAL TO LORD LISTER.

THE movement to commemorate the great services of Lord Lister in the city in which he made, and put into practice, the discoveries which have done so much for the alleviation of human suffering, originated as far back as February, 1912, when a committee of citizens was appointed to promote the memorial and obtain the subscriptions therefor, but owing to the war the prosecution of the scheme was interrupted. The appeal for funds was most generously responded to, and the scheme generally met with the most unqualified approval. Subscriptions were received from individuals and scientific societies in this country and abroad. Various suggestions were made as to the most fitting manner in which Lord Lister's memory should be commemorated. One of the proposals which received almost universal support was the preservation of the old "Lister Ward" in the Glasgow Royal Infirmary, with the idea of making the ward a medical museum not only for the housing of personal relics of Lord Lister and of his period, but also to demonstrate the evolution of the science and art of surgery since his day. However, the managers of the Royal Infirmary declined to entertain the proposal and caused the historic ward to be demolished, notwithstanding widespread protest not only from the citizens of Glasgow but from scientific men and scientific bodies all over the world. In the course of their labours the committee collected—largely through the personal efforts and enthusiasm of Mr. A. E. Maylard, who until recently was the senior surgeon of the Glasgow Victoria Infirmary—a number of valuable objects of interest and other relics relating to the life and period of Lord Lister, including several portraits of him; photographs of the houses and institutions with which he was connected; several documents and autograph papers; his robe, hoods, and trencher; a hundred of his books; models of old operating tables and various instruments; specimens of the dressings used by Lord Lister; examples of sprays and other apparatus which belonged to Lord Lister, and various pieces of old furniture. This collection is at present being temporarily housed in the Pathological Department of the Royal Infirmary.

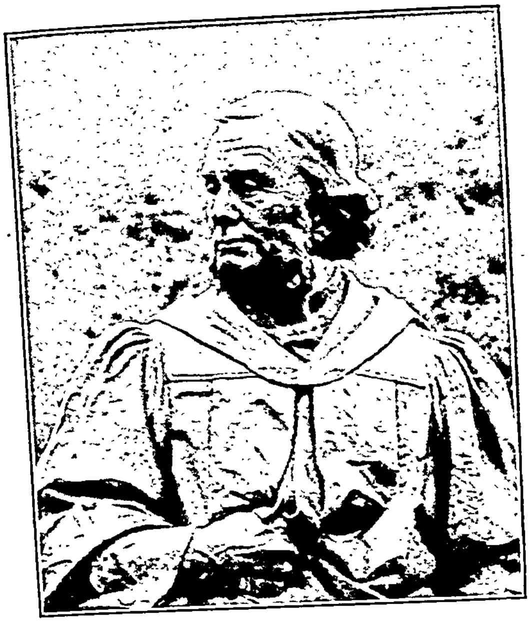
FIG. 1.



STATUE IN KELVINGROVE PARK.

When the Memorial Committee realised that the decision of the directors of the Royal Infirmary to demolish the ward was irrevocable it was decided to apply the funds at the committee's disposal to the erection of a statue of Lord Lister to be placed in the Kelvingrove Park, immediately below the University of Glasgow, of which he was at one time so distingusihed an ornament, and on a site adjacent to the one occupied by a similar statue of his old contemporary and colleague, Lord Kelvin. This statue, designed by Mr. Paulin, A.R.S.A., which shows Lister in his robes, seated, was unveiled on Sept. 17th by Sir Hector C. Cameron, emeritus professor of surgery in the University of Glasgow, and one of the last survivors of Lord Lister's house-surgeons and assistants. No more appropriate choice could have been made than of one who throughout his life retained the affection and regard of his great master.

FIG. 2.



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The Lord Provost of Glasgow, who is chairman of the Lord Lister Memorial Committee, presided at the ceremony, and amongst those present were the Lord Provost of Edinburgh, Sir Donald MacAlister, Principal of Glasgow University, Sir William Watson Cheyne, ex-President of the Royal College of Surgeons of England, Sir Harold J. Stiles, President of the Royal College of Surgeons, Edinburgh, Prof. T. K. Monro, President of the Royal Faculty of Physicians and Surgeons, Glasgow, Sir Thomas Oliver, of Newcastle-on-Tyne, Lord Blythswood, and Lord Maclay.

Medicine and the Law.

INQUEST VERDICT AGAINST A MEDICAL MAN.

AN inquest was held recently at Gloucester upon the body of Nellie Burnham, 10½ years of age, the daughter of a steel presser, working in America, who died on August 10th. At the conclusion of the evidence the jury returned a written verdict that "the child died from diphtheria and pneumonia, and that Dr. Hadwen failed to show competent skill and special attention, in consequence of which failure the child died." The coroner (Mr. G. Trevor Wellington) said that this in law was a verdict of manslaughter and committed upon his warrant Dr. W. R. Hadwen to take his trial at the next Gloucester assizes, allowing bail. Since then Dr. Hadwen has been brought before the magistrates and remanded on bail upon the same charge, only formal evidence being given.

At the inquest the evidence of the mother was to the effect that she called in Dr. Hadwen on August 1st to see the deceased child, who had a bad throat and talked thickly. Dr. Hadwen ordered a gargle of warm water and vinegar. He examined the child's throat, chest, and back. He saw the child again on the 4th and 6th, and told her to paint her throat with glycerine as she could not gargle. On the 9th Dr. Hadwen saw the child at 10.30 A.M., made an examination, and, according to the witness, said that there was scarcely anything the matter, and that the child would soon be well. She also said that he was in the house for only five minutes. He told her to give the child, who could not keep down the milk which he had ordered previously, milk diluted with water. A consultation of relatives was held during that day, as the result of which Dr. E. S. Ellis was called in and saw the child at 10.15 P.M. He diagnosed diphtheria and pneumonia, and held out little hope of the patient living. She died soon after midnight (12.50 A.M., August 10th). The witness said she had suspected diphtheria, but had not said so to Dr. Hadwen. Dr. Hadwen had attended other children of hers, who since he did so had been removed to the isolation hospital. Recalled later, she admitted in cross-examination that the child two days before her death had got out of bed and gone down barefoot to the kitchen to get a drink of water, and that she had not told Dr. Hadwen of this.

Dr. Ellis gave particulars of his examination of the deceased whom he found suffering from diphtheria, bronchitis, and pneumonia. He had little expectation that the child would recover, and notified the case as diphtheria. If he had found the earlier symptoms described by the mother he would have taken a swab, also pulse and temperature. He criticised the treatment ordered by Dr. Hadwen as of little value, and thought that proper treatment and accurate diagnosis ought to have saved the patient's life. He had not given a certificate as he had not attended during the illness.

An aunt of the mother corroborated her evidence as to Dr. Hadwen having said there was little the matter with the child on the morning of the 9th.

Dr. R. B. Berry, city medical officer of health, said he had received no notification of diphtheria affecting the Burnham's house from Dr. Hadwen.

Dr. W. Washbourn gave details of the condition shown by post-mortem examination. Death, in his opinion, was due to diphtheria and pneumonia. Leaving bacteriology out of the question, he thought a medical man should at least have suspected diphtheria from the clinical symptoms. Dr. Washbourn, cross-examined on behalf of Dr. Hadwen as to the incident of the child getting water from the kitchen, said that it might have resulted in a chill and brought on pneumonia. From the condition of the bronchial tubes and the adherent membrane he would ascribe death to diphtheria rather than to pneumonia.

A neighbour, whom the mother had told about the child fetching water, and who had communicated with Dr. Hadwen's solicitor, also gave evidence.

Dr. Hadwen, who was called and cautioned, declared himself willing to give evidence, and contradicted the statements of the mother in several particulars, stating that his visits had been longer and his examinations more detailed than she had described. He had attended a brother and sister of the deceased in July, and had found in them no symptoms of diphtheria, after considering the question whether they were suffering from it. On August 1st he had found the deceased suffering from a bad cold, had considered the question of diphtheria, and came to the conclusion that her case was similar to that of her brother and sister. He described her symptoms and his treatment in detail, stating that he had found the latter effective in similar cases. He had felt the child's pulse, usually looking at the throat at the same time, on each occasion that he had been to the house. He maintained that it was easy to diagnose diphtheria, as the membrane could not be mistaken. He did not take a swab because the diphtheric bacillus was found in every kind of sore-throat and in the majority of healthy throats. Several questions were asked as to this by the coroner, Dr. Hadwen maintaining his opinion and saying finally, "I should like to point out that the modern germ theory is all bosh." He said that there was no clinical symptom or physical sign of diphtheria in the deceased from first to last, but that when he saw her on the 9th there was a marked change in her condition and "inflammation of the right lung, known as croupous pneumonia." He had tried to find out the cause of the change, but had not been told of the child going downstairs. He had not told the mother that there was little the matter. Such a suggestion was absurd. He had advised her to give milk, and said it was the child's only chance, but had avoided frightening the mother as well as he could. He was emphatically of opinion that the child contracted pneumonia in going downstairs and died from pneumonia. The witness expressed at length his views on the bearing of the conditions observed by him and those revealed by the post-mortem examination upon this point.

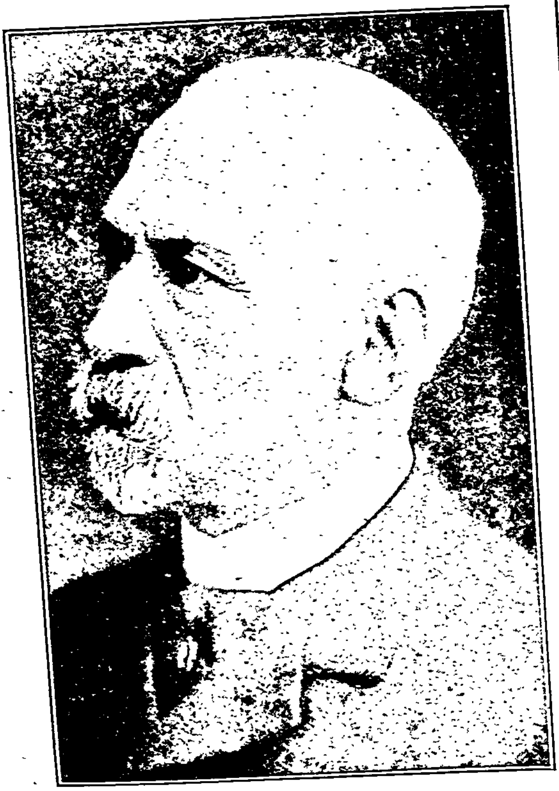
The coroner, in addressing the jury, explained the distinction between negligence and gross negligence as affecting their verdict, and drew their attention to the contradictions in the evidence. They had to determine (1) whether diphtheria was the cause of death; (2) whether there was negligence by reason of failure to use competent skill and/or to give sufficient attention; (3) if they thought there was negligence, did they think it was gross? Finally, did they believe that the negligence caused contributed to or accelerated the death of the deceased? The jury's answer, which it will be observed does not follow strictly the lines suggested by the coroner, is given above.

Obituary.

SIR FREDERICK NEEDHAM, M.D. St. And.,

COMMISSIONER OF THE BOARD OF CONTROL.

The death of Sir Frederick Needham, for 27 years Commissioner of the Board of Control, which took place at the advanced age of 88 on Sept. 6th at his residence in Bournemouth, severs an important link with the past in the study and treatment of mental disorders, and with the numerous improvements that have taken place during the past three-quarters of a century in the conditions under which insane patients are housed and treated.



Sir Frederick Needham.

The second son of Dr. James Peacock Needham, he was born at York, where he received his early education at St. Peter's School. He studied medicine at St. Bartholomew's Hospital, London, and qualified M.R.C.S. in 1858, and M.D. St. And. in 1862. Three years later he became a Member of the Royal College of Physicians of Edinburgh. On qualifying at the age of 22, Needham was appointed to the medical superintendentship of the York Hospital for the Insane (Bootham Park). Those were the days when an active campaign was still being conducted by the most enlightened of the physicians in mental disorders against the systematic use of mechanical restraint and other allied forms of treatment which, happily in this country, have long ago been discarded. Of all these devices Needham was always a stern opponent; even as respects forced alimentation by the nasal or œsophageal tube, salutary and life-saving as he admitted them to be when promptly and judiciously used, he urged that there were not a few cases in which rectal feeding was kinder, safer, and as efficacious. In this connexion and to anticipate for a moment his work as a Commissioner, it is of interest to know that it was he who, on behalf of the Board, drew up not only the Regulations made under the section in the Lunacy Act dealing with mechanical restraint, but also the definition of "seclusion"—the steady enforcement of both of which has left so deep a mark in the better treatment of the insane. Much good work was done by Needham at Bootham Park, and when he left in August of 1874 to take up the post of superintendent at Barnwood House (Gloucester)—another well-known hospital for the insane—it was in no uncertain terms that the committee of governors testified to the energy, zeal, ability, and success with which he had discharged very onerous duties during a period of 16 years.

By a somewhat curious coincidence, it was for a nearly identical period—a few months more—that he was destined to preside at Barnwood. This hospital already enjoyed a high reputation; but Needham with his now matured experience and foresight, and with the support and goodwill of his committee, was able to effect various developments and adaptations—all of which materially added to the comfort of the patients and the efficiency of their treatment and have stood the test of time—and he left the hospital occupying a still more honourable and important position. While at York he had married Charlotte, the daughter of the Rev. J. Shooter, vicar of Bishop Wilton in Yorkshire, whose wisdom and the influence of whose personality were of signal help to her husband in his work at Barnwood; and, when they left, a graceful tribute to her voluntary assistance was paid by the governors of the hospital. She died in 1907, and a stained window to her memory was placed in the chapel of the hospital.

It was in April, 1892, when Sir Clifford Allbutt relinquished his Commissionership upon being called to Cambridge as Regius Professor of Physic, that Dr. Needham was offered and accepted the post of Commissioner in Lunacy, a position he filled with conspicuous distinction until his retirement in June, 1919, and it was naturally in this capacity that his influence came to be most widely felt. Tall, dignified in appearance, and fearlessly outspoken he was by some held somewhat in awe, especially in his early days as a Commissioner; but whatever austerity of manner there may have been—and he could, indeed, be stern when occasion demanded it—this was very superficial, and closely beneath it was a kindliness of heart, a uniformly good temper, and a full measure of that spirit of helpfulness which has been said to give to the profession of medicine its value to humanity. Broad-minded, peculiarly tolerant of opposition and of the views of others, a most patient listener to conflicting claims, and endowed with a keen sense of justice, his judgment, opinion, and advice were of immense value and weight to the Board of Control; and it was no wonder that, when he decided to retire, his colleagues, by each and all of whom he was revered, felt his loss to be irreparable. He had a vitality, mental and physical, which enabled him, right up to his retirement and despite his advanced age, to do his full share of travelling and official visits.

If some characteristic of his attitude towards his position be sought, it can safely be said that, over and above the inspectorial and advisory duties of the Board, he always considered that any question affecting personal liberty and the propriety of remaining under certificates was of paramount concern, and that it was of vital importance to maintain a close and individual touch between the Commissioners and the patients to whom the former should at all times, either at visits or through the post, extend a sympathetic ear. His so often reiterated question, "How will this affect the patients?" might, indeed, be quoted as his work's motto. That a large section of the patients were conscious of the friend they had in Sir Frederick Needham is testified by their numerous inquiries addressed to his former colleagues as to his welfare.

In disposition somewhat retiring, Sir Frederick Needham was no recluse. In 1904 a Royal Commission on the Care and Control of the Feeble-Minded was set up, of which he was an active member. This

Commission undertook a very extensive survey of the problem, visiting various districts of England, Scotland, and Ireland, as also America and several countries of Europe. He also held office in many societies. He was at one time president and subsequently honorary member of the York Medical Society and of the Gloucestershire Medical and Surgical Association; in 1887 he was president of the Psychological Association of Great Britain and Ireland; in 1890 he was president of the Psychological Section of the British Medical Association, and he enjoyed honorary membership in the Medico-Legal Society of New York. He was a member of the Council of Epsom College. He contributed a number of thoughtful and valuable papers to medical literature; in which connexion, as characteristic of his loyalty, mention may be made that, while in his 1890 presidential address he strenuously deprecated, among other matters, the function of the magistrate in the making of reception orders as being likely to delay and hamper treatment in early stages of mental illness, he was as a Commissioner inflexible in seeing that the provisions of the Lunacy Acts and, later, of the Mental Deficiency Act were duly carried out. In 1871 he published a paper on the necessity for legislation in reference to habitual drunkards, followed a few years later by "Insanity in Relation to Society." Among his works are also "Brain Exhaustion," and "Thirty Years of Lunacy Practice." No servant of the public has better deserved the honour of knighthood, which was conferred upon him in 1915.

In 1913 Sir Frederick Needham remarried, his second wife, by whom he is survived, being Helen, daughter of Mr. W. L. Newman, of York. In the sorrow of her bereavement Lady Needham has the consolation of knowing that, as all her late husband's more intimate friends know, she brought great happiness and comfort to him in his latter years.

C. H. B.

ROBERT JAMES FARMAN, L.M.S.S.A. LOND.

Dr. R. J. Farman, secretary of the London Panel Committee, died last week at the age of 55, after an illness lasting for several months. He was born at Gosport, was educated at Ely School and Charing Cross Hospital, and qualified L.S.A. in 1894. He practised in South Wales until 1910 when he removed to Kennington, where he conducted a large general practice. He was a member of the Local Medical and Panel Committees for the County of London from their formation, retiring from practice upon being appointed secretary to these committees in September, 1920. With a vivid experience himself of general practice in industrial areas, he threw himself wholeheartedly into the interests of insurance practitioners who constantly sought his advice. With a flair for organisation, Dr. Farman was a splendid committee man, one of the rare sort who get things done. Among his activities he was a member of the allocation subcommittee of the London Insurance Committee, a member of the distribution committee, and secretary to the committee of management of the dinner held in connexion with the annual panel conferences.

Dr. B. A. Richmond, an earlier secretary of the London Panel Committee, writes: "Farman will be much missed. He was a loyal colleague and a staunch friend. Brave under great physical disabilities, a man of high ideals, untiring in his efforts for the improvement and efficiency of the insurance service. The practitioners of London are greatly in his debt."

THE LATE DR. ALBERT HAWORTH.

Dr. J. Henry Dible writes: "Haworth's passing will leave a very real gap in the Manchester medical school. His teaching ability was marked and his enthusiasm for chemistry was to him a compelling one and the central note of his character. Touched with something of the artistic temperament, musical, generous in disposition, and with a keen sense of humour, he was an extraordinary likable personality. His popularity was great, both with the students, with whom he never lost touch, and with his friends in the medical school, in whose remembrance he will always live, a bright, human, and lovable figure. His bent was almost wholly chemical, and he was given leave for a period to study the current methods of chemical pathology at St. Thomas's Hospital. On his return to Manchester he organised a department for teaching this subject and was made assistant lecturer in chemical pathology in 1922. In this post he succeeded eminently, having true enthusiasm for his subject and a very genuine gift for teaching it. His keenness and personal method of teaching reacted upon his students, and his course became at once successful and greatly appreciated. At the same time he engaged in research work upon various metabolic problems, especially upon conditions affecting the blood-sugar and, latterly, upon renal function in experimental nephritis."

Correspondence.

"Audi alteram partem."

THE DIAGNOSIS OF A HEALTHY HEART.

To the Editor of THE LANCET.

SIR,—Dr. John Parkinson's address in your issue of Sept. 6th is an excellent and concise summary of the cardiology of the present day, and any physician who knows thoroughly the contents of this article, and can act on them, has little to fear in the way of making grave mistakes. I think perhaps it will be generally agreed that the weakest point with the average general practitioner is his knowledge of heart cases. Many are now able to recognise and treat auricular fibrillation, but it is still quite common to see patients who exhibit merely the phenomenon of premature contractions condemned to a life of invalidism on account of their heart, whereas the heart is perfectly sound. If the general practitioner would realise that so long as a patient exhibits no sign either of shortness of breath or pain in the chest, there is little to worry about as regards stethoscopic findings, fewer people would be condemned to a life of invalidism. Patients so condemned rapidly become cardiac neurasthenics.

There is one statement in the article that I cannot reconcile with the teachings of Sir James Mackenzie and Sir Thomas Lewis. Dr. Parkinson states that paroxysmal tachycardia is "the best example we can quote of a functional heart disease." But is it a functional disease? I have always understood that this condition denotes myocardial changes. Sir Thomas Lewis writes ("Clinical Disorders of the Heart Beat"): "The attacks are themselves important indications of muscle damage, and the attacks frequently place the life of the patient in jeopardy." and again, "The prognosis of the individual attacks contains an element of uncertainty. Death during paroxysms has occurred on not a few occasions." I have never seen a death from paroxysmal tachycardia, but I have seen some cases certainly in a state of jeopardy. Can a "functional" state produce this? If it can, is it functional? We know that in some of these cases the grade of heart failure is sometimes grave in the extreme. We know that œdema of the ankles and face may occur, that blood-stained sputum is brought up, that there may be marked basal œdema (a certain sign of cardiac failure), and that later the patient may collapse and go through the stages of progressive failure, delirium, ascites, general anasarca, and death. We know, too, that cyanosis and general venous engorgement may take place, along with bulging of the liver and even enlargement of the spleen. Can these things be regarded as "functional"? If so, it is a functional disease of the heart that may kill.

With patients with true paroxysmal tachycardia it has been my habit in the past to give the relatives a guarded prognosis: I have stated to them that. although the chances of the condition proving fatal are remote. the patient cannot be regarded as having a sound heart and that catastrophe is possible. Have I been giving a prognosis more guarded than was really necessary? Is one entitled to tell the relatives that the condition is purely functional and that there need be no anxiety?

I am, Sir, yours faithfully,
A. GRAHAM-STEWART.
Margate, Sept. 9th, 1924.

THE PRESENCE OF A THIRD TYPE OF CELL IN THE GLANDS OF THE STOMACH.

To the Editor of THE LANCET.

SIR,—Some recent experiments carried out with certain new staining methods have revealed a third type of cell in the stomach glands. They were first observed in the central portion of the stomach, either wedged in between the oxyntic cells and the peptic cells, or were more frequently situated amongst the peptic cells. They were found scattered singly throughout the glands. The cells are small and granular and have a round nucleus. When stained by a special method their staining is quite different from either the oxyntic or the peptic cells, and, with their special structure and characters revealed, they can be easily seen and differentiated. Their distribution in the stomach of man and various animals is now being investigated, as is also the possibility of there being a similar type of cell in the intestinal glands. It seems possible that the secretion from these cells may play an essential part in activating the pepsinogen.

A full description of these cells and their distribution and the staining methods by which they can be demonstrated will be published.

I am, Sir, yours faithfully,
FREDERICK W. TWORT, M.R.C.S., L.R.C.P.,
Superintendent of the Brown Institution,
University of London.
Sept. 15th, 1924.

COCAINE FOR EUTHANASIA.

To the Editor of THE LANCET.

SIR,—For several years I have used cocaine in the last stages of phthisis. Its benefits are so great and its use apparently so little known that a note on the subject may be justified. In the later stages of phthisis patients may be remarkably comfortable, especially if it is a pure tuberculous invasion with little or no added infection—or they may be carried off by a sudden hæmoptysis and be spared the suffering of the last phase. I have several times seen children dying of this disease remain calm and comparatively happy to the very end whose lungs have been riddled with disease and containing large cavities; they have slept a great deal and have appeared to suffer very little. Frequently, however, this is not the picture. The patient becomes apprehensive, restless, sleepless, he coughs much and brings up much phlegm, he is wasted to a shadow and his bony points pain him, his throat and larynx are frequently ulcerated, it hurts him to speak, to swallow, or even to breathe, coughing may become an agony to him and to others. Morphia may give immense comfort in some cases, but almost always when this is started a rapid deterioration takes place; in others less relief is given and there may be nausea and vomiting with flatulence, abdominal pain, and distension. The breathing becomes difficult with much rattling, and the relatives beg for something more to be done. It is just in such cases that I have found cocaine so useful. After its administration the patient becomes calmer, happier, the rattling often ceases, and almost a smile will come over the features. In an earlier stage than this, too, when death is long in coming and the patient seems to cling desperately to the tragic remnants of his life, cocaine will greatly relieve, and I would give it in preference to morphia or any opium derivative.

Cocaine should be given orally and by subcutaneous injection so that it may exert both its local and its general action. Enough must be given to produce a definite effect. I usually begin by giving gr. $\frac{1}{4}$ of the hydrochloride hypodermically, and gr. $\frac{1}{4}$ dissolved in some lemon juice and water with sugar to be sipped; both can be repeated as often as is desired at suitable intervals. The same treatment may be given in carcinoma of the stomach, and many other diseases where the patient dies slowly.

I am, Sir, yours faithfully,
F. G. CHANDLER, M.D. Camb., M.R.C.P. Lond.
Park-square West, N.W., Sept. 10th, 1924.

DIETETIC METABOLISM.

To the Editor of THE LANCET.

SIR,—In his interesting address in your issue of Sept. 13th, dealing with the remarkable capacity of man for metabolising almost any kind of food, Dr. C. J. Macalister suggests that dietetic variations of metabolism in man result from "recurrence, sometimes to carnivorous, sometimes towards a vegetarian type, and, if that be so, we must take it that there was a common stock from which both those types resulted." The adaptability of a living organism in its power of metabolism of other than its traditional and accustomed food is presumably a sound asset in favour of its survival. Some insects have this faculty in a high degree. Why should the female anopheles desert her native plant juices to suck mammalian blood at night? Is she in search of fresh hormones or what is the impulse? If, as Dr. Macalister suggests, there is a common stock for carnivorous and vegetarian feeders, the original ancestral form might well be a plant, for does not the sundew, tempted by the wealth of gnats in its native marsh, evolve a special method of ensnaring and a special faculty for digesting the said insects? But why stop at the sundew; have not some bacteria more or less a similar adaptability as regards metabolism? The carnivorous plant has always seemed to me to strengthen the argument in favour of a common origin of vegetable and animal life.

I am, Sir, yours faithfully,
DAVID WALSH
Bentinck-street, W., Sept. 14th, 1924.

SIR MALCOLM MORRIS MEMORIAL FUND.

THE hon. secretary of the committee sends the following supplementary list of subscribers to this Fund. The total to date is £476 14*s*. 8*d*.

Messrs. Bird and Bird, Mr. A. W. Byrne.
Prof. Winifred Cullis, D.Sc.
Girls' Boarding School Co., Limited.
Mr. Arthur Morris, Mr. A. Crichton Morris, Mr. Charles A. Morris, C.V.O.
National Association for the Prevention of Tuberculosis.
Sir Herbert Thompson, Mrs. Catherine Thursby.
Dr. Bertram Watson.

Further subscriptions will be gratefully acknowledged if forwarded to the Hon. Treasurers, "Sir Malcolm Morris Memorial Fund," at 12, Stratford-place, London, W. 1.

AN IRISH HAMPDEN.—Our Irish correspondent writes as follows:—Dr. J. A. O'Halloran was summoned before the Longford district court recently for failure to exhibit a licence duty disc on his motor-car. He said that he had not paid his motor tax because there were no roads in the county, and he asked that the case might be dismissed. A fine of five shillings was imposed. A few months ago a similar procedure took place, and Dr. O'Halloran, declining to pay the fine, was sent to goal. On his arrival at the gaol, at a distance of some 60 miles from his home, he paid the fine. The police authorities were put to the expense of driving him to gaol and back by motor. As they had difficulty in obtaining a car, it is said that they had to hire Dr. O'Halloran's own car for the journey. Subsequent to this incident some attempt was made by the Longford county council to make the roads fit for traffic, but owing to a labour dispute work was abandoned. The roads of the county have been neglected for several years and are said to be almost impassable.

Medical News.

OPENING OF THE MEDICAL SCHOOLS.—The following functions will be held in connexion with the opening of the undermentioned London Medical Schools:—

St. Bartholomew's Hospital.—Old students' dinner, Wednesday, Oct. 1st, in the great hall of the hospital.

Charing Cross Hospital.—Distribution of prizes by Sir Humphry Rolleston in the out-patients' hall of the hospital, Oct. 1st, at 3.30 P.M. Chairman: Dr. W. Cecil Bosanquet. Annual dinner of past and present students, in the Adelaide Gallery, Gatti's Restaurant, Strand, W.C. 2. Chairman: Mr. Charles Gibbs.

St. George's Hospital.—Prize distribution in large lecture theatre, Wednesday, Oct. 1st, at 3 P.M. Inaugural address by Sir Isambard Owen. Annual medical school dinner, Wednesday, Oct. 1st, at the New Hotel Metropole. Chairman: Sir Isambard Owen.

King's College Hospital.—Prize distribution, Wednesday, Oct. 1st, 2.30 P.M. Inaugural address by Sir David Ferrier. Chairman: Viscount Hambleden. Past and present students' dinner, Wednesday, Oct. 1st, at the Connaught Rooms, Great Queen-street, W.C. Chairman: Mr. Charles P. Childe.

London Hospital.—Old students' dinner, Wednesday, Oct. 1st, at the Trocadero Restaurant, Shaftesbury-avenue, W.C. Chairman: Prof. William Bulloch.

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Westminster Hospital.—Introductory address by Mr. H. J. Waring on the Medical Man of the Future, in the board room of the hospital, Thursday, Oct. 2nd, at 3 P.M.

UNIVERSITY OF DURHAM.—At the opening of the winter session of the College of Medicine, Newcastle-upon-Tyne, on Oct. 6th, the address to the students will be delivered by Sir Thomas J. Horder, Bart.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—This school will celebrate its jubilee in October, in connexion with which the following celebrations will be held: (1) A service of thanksgiving for the opportunities of training, work, and service, open to women in the last 50 years, at St. Paul's Cathedral, on Saturday, Oct. 25th, 2.30 P.M. (2) Dinner in the Guildhall on Friday, Oct. 24th. (3) An evening party at the medical school, Saturday, Oct. 25th.

An attractive pamphlet just issued by this school sets out briefly its history and summarises the progress achieved in the medical education of women since its foundation in 1874. At that time there were only two women in the Medical Register and 14 students at the school. To-day there are about 2000 women on the Register, of whom more than half were educated at this school. To celebrate the jubilee of the school it is hoped to endow chairs in physiology, pathology, and anatomy, to be named after the three great women pioneers in medicine, Elizabeth Blackwell, Elizabeth Garrett Anderson, and Sophia Jex-Blake, of whom charming portraits appear in the pamphlet. Donations to the Endowment Fund should be made payable to Sir Alan Garrett Anderson, hon. treasurer to the school, and addressed to the organising secretary of the Fund, Mrs. K. B. Duffus, 8, Hunter-street, London, W.C. 1.

QUEEN'S UNIVERSITY (BELFAST) CLUB, LONDON.—The second dinner of the club will be held in the Hotel Belgravia, Grosvenor-gardens, S.W., on Thursday, Oct. 9th, at 8 P.M. Open to members and to Queen's students and graduates desirous of becoming members. The charge for the dinner will be collected at the occasion. Those intending to be present are requested to notify, not later than Oct. 6th, the hon. secs., at 17, Wimpole-street, W. Previous to the dinner there will be held the annual meeting, beginning at 7.15 P.M.

SUMMER Time will cease on Sunday next, Sept. 21st, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich Time. Last year Summer Time ceased on Sunday, Sept. 16th.

DONATIONS AND BEQUESTS.—The following, among other, bequests are made under the will of the late Mr. Samuel Woolland: £2000 to St. George's Hospital; £1000 to King Edward's Hospital Fund; £1000 to Fulham Cancer Hospital; £500 to the Royal Hospital at Winchester; £500 to the Royal Devon Hospital, Exeter; and £500 to Dr. Barnardo's Homes.

EXTENSION OF ABERGELE SANATORIUM.—The Manchester Public Health Committee have adopted a scheme to provide accommodation for 200 beds at the Abergele Sanatorium for surgical tuberculosis cases. At present there are only 10 beds for such cases at the sanatorium. The original scheme set out to provide 500 beds. The decision goes as a recommendation before the Finance Committee for approval or otherwise.

ROYAL DENTAL HOSPITAL OF LONDON.—A special Children's Department and an extension of the X ray Department are urgently needed to meet the requirements for the treatment of the poorer classes at the Royal Dental Hospital of London. The cost has been estimated at £3000, and in order to help in raising this sum a concert will be held at the Alhambra Theatre on Sunday evening, Oct. 5th, at 7 P.M. Sir Oswald Stoll has given the use of his theatre, and many well-known artists have promised to appear, including Mr. George Robey. The Prince of Wales, who is President of the hospital, has endorsed the appeal on its behalf in an autograph letter. Applications for tickets should be made to the hon. secretary, Lord Burnham's Appeal Fund, at the hospital, 32, Leicester-square, London, W.C. 2.

PROPOSED HOSPITAL FOR DISEASES OF THE HEART IN LIVERPOOL.—An influential meeting has been held in Liverpool to promote a movement for the establishment of a special hospital which would be entirely devoted to the study and treatment of diseases of the heart. The need for such a hospital for Liverpool and the surrounding district has been felt for a long time past by medical men. The meeting was addressed by Prof. Richard Caton, formerly professor of physiology, a former lord mayor of the city and pro-Chancellor of the University, also by Prof. J. M. Beattie, Sir James Paton, and others. It was unanimously resolved to take steps immediately to establish such a hospital. Suitable premises are available and substantial offers of financial assistance were announced and a general committee was nominated with Sir James Paton as chairman. The hospital will be the first of its kind in the district and will provide treatment for both in-patients and out-patients. In Liverpool alone something like 1500 persons are estimated as crippled from cardiac disease traceable to rheumatic fever.

COTTON SPINNERS' CANCER.—Information has been received by the Operative Cotton Spinners' Amalgamation that the Insurance Section of the Master Cotton Spinners' Federation has decided to accept and not to appeal against the "test" case decision at Ashton county court (THE LANCET, August 16th, p. 358) that epithelioma of the scrotum, from which a spinner had died, arose in the course of his employment and therefore falls within the scope of industrial diseases under the Workmen's Compensation Act. It is stated that the decision not to appeal was arrived at on legal advice. There are, according to the operatives' secretary, 100 cancer cases on his books awaiting decision. Much is hoped for—as a result of the publicity given to the case—in the matter of prevention of the disease. The Council of the Amalgamated Association of Operative Cotton Spinners and Twiners suggest that no worthier field in which to work can be found than for scientists by investigation to undertake the task of banishing this disease from all connexion with cotton-spinning. It is suggested that the trade itself, in conjunction with the medical profession, might investigate the cancer-producing properties of mineral oil and direct their efforts to the production of an oil innocent of such properties, or at least to the provision or improvement of preventive measures.

ARSENIC IN FOOD WRAPPERS IN SALFORD.—In his annual report of the borough of Salford for 1923 the borough analyst—Mr. J. D. Elsdon—states that when examining a sample of proprietary bread, it was discovered that the violet ink used for the printing of the wrapper contained appreciable quantities of arsenic. This led to the chemical examination of a large number of coloured wrappers and a number of coloured papers and inks used for printing. Of 51 sample wrapers nine contained an appreciable quantity of arsenic—the colours being two blue papers, five purple, and two green. The quantity of arsenic in one paper faced with a purple colour was about one-third of a grain per square foot of surface. Of nine different samples of printers' ink used for wrappers all were arsenic-free with the exception of one violet ink which contained about 10 per cent. of

arsenic calculated as arsenious oxide. The presence of the arsenic is due to the use of arsenic lakes in the colours from which the printing ink is made. It is alleged that by this means brighter colours are obtained. There is no real reason for their use. As to the milk sold in Salford, it compares favourably with that sold in other districts. With a standard—a lenient one—of more than 5 parts of sediment in 100,000—classified as "adulterated," no sample was so classified after the early months of the year. But the question of dirty milk is one of peculiar difficulty, as the retailer may quite easily remove the bulk of the visible dirt by filtration immediately before selling the milk. There may, however, be serious bacterial contamination, which is the usual concomitant of visible dirt. Out of 26 samples of jam taken and representative of the product of 20 different manufacturers, only seven, prepared by six different manufacturers, had been preserved with cane or beet sugar only. Eighteen samples from 13 vendors contained 8 to 20 per cent. of glucose syrup, while one sample contained as much as 35 per cent. of glucose syrup. Out of 32 samples of golden syrup 22 were found to be genuine golden syrup derived from cane or beet sugar products.

Appointments.

BARCLAY, J. H., M.D. Durh., has been appointed an additional Medical Referee under the Workmen's Compensation Act for the Districts of Gateshead, Hexham and Bellingham, &c.

CHAPMAN, DORA, M.B., Ch.B. Sheff., and ORD, J. W. E., M.D., C.M. McGill, Visiting Anæsthetists to the Jessop Hospital for Women.

GRAHAM, M. J., M.B., B.Ch. N.U.I., Medical Officer, Federated Malay States.

NEGUS, V. E., M.S., F.R.C.S., Junior Surgeon for Diseases of the Throat and Nose at King's College Hospital.

SELLARS, J. A., M.B., Ch.B. N.U.I., Hon. Assistant Physician, Blackburn Royal Infirmary.

THOMAS, B. M. G., M.R.C.S., L.R.C.P. Lond., Superintendent Medical Officer to the Pontypridd Board of Guardians at the Llwynypia Hospital.

WHITELAW, A. D., M.B., B.Ch., D.P.H. Camb., Temporary Assistant School Medical Officer in the Public Health Department of the City of Norwich.

WILLIAMS, H. M., M.R.C.S., L.R.C.P. Lond., D.P.H., Tuberculosis Physician to the County of Carmarthen.

Salford Royal Hospital: MCCAY, A. W., M.B., Ch.B. Edin., DAVIDSON, ALEX. W., M.B., Ch.B. Edin., House Surgeons; STOUT, A. J., M.B., Ch.B. Edin., Casualty House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital, Cheshire.—H.S. £125.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.
Bethnal Green Board of Guardians.—Asst. M.O. £400.
Birkenhead County Borough.—Asst. M.O. £450, res.
Bradford City.—Asst. Bacteriologist. £600.
Bradford Royal Infirmary.—Two H.S.'s and one H.P. Each £150.
Burton-upon-Trent County Borough.—Asst. M.O. £600.
Buxton, Derbyshire, Devonshire Hospital.—Asst. H.P. £150.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—P.
Durham County Council, Maternity and Child Welfare.—Asst. Welfare M.O. £600.
Evelina Hospital for Children. Southwark, S.E.—H.P. £120.
Glasgow, Anderson College of Medicine, Dumbarton-road.—Chair of Surgery.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50. Also H.P. and Asst. Cas. O. £50.
King's Lynn, West Norfolk and King's Lynn Hospital.—Asst. Res. M.O. £150.
Leeds City.—Asst. Clin. Tuberculosis O. £600.
Leicester Royal Infirmary.—H.S. £150.
Liverpool.—M.O.H. £1800.
London Lock Hospital, 91, Dean-street, W.—H.S. £200.
Manchester, St. Mary's Hospitals.—Four H.S.'s. Each £50.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Hon. M.O. for Skin Dept. H.P. £125.
Ministry of Health.—Three M.O.'s. £600.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Phys. to Out-patients.
Northampton General Hospital.—Hon. P.
Nottingham General Dispensary.—Res. S. £250.
Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.
Plymouth, South Devon and East Cornwall Hospital.—H.S. and H.P. £100 and £50 respectively. Also Asst. H.S. £50.
Portsmouth, St. Mary's Infirmary, &c.—Third Asst. Res. M.O. £250.
Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P., Each £150. Also Jun. H.S. and H.P. Each £110.
Queen's Hospital for Children, Hackney-road, E.—H.S. £100. Two H.P.'s, Cas. H.S. Each £100. Also P. in charge of Skin Dept.
Rhondda Urban District Council.—Asst. Sch. M.O. £600.
Richmond, Surrey, Royal Hospital.—Asst. H.S. £100.
Royal Chest Hospital, City-road, E.C.—P.
Royal Ear Hospital, Dean-street, Soho.—Reg. £50.
Royal Free Hospital, Gray's Inn-road, W.C.—Med. Reg.
Royal Naval Medical Service.—Surg. Lieuts. 25s. per day.
Royal Westminster Ophthalmic Hospital, King William-street, Strand, W.C.—Asst. H.S.
Seamen's Hospital Society, Greenwich.—H.S. for Albert Dock Hospital. Also H.P. and H.S. at Dreadnought Hospital. Each £150.
Shanghai Municipal Council, Public Health Department.—Asst. Path. £1250.
South London Hospital for Women, Clapham Common, S.W.—H.P. and three H.S.'s. Each £50. Clin. Asst. £1 1s. per attendance.
University College Hospital, Gower-street, W.C.—Res. M.O. £150.
Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.
West End Hospital for Nervous Diseases, Regent's Park, N.W.—H.P. £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non. Res. H.S. £150 and £100 respectively.
Westminster Hospital, S.W.—Hon. Asst. Administrator of Anæsthetics.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments:—St. Albans, Herts; Westerham, Kent; Kidwelly, Carmarthen.

Births, Marriages, and Deaths.

BIRTHS.

HEAF.—On Sept. 13th, at Hertford Hill, Warwick, the wife of Frederick Heaf, M.D., of a son.

LEWIN.—On Sept. 9th, at a London nursing home, to the wife of Dr. George Lewin, of 1, Haling Park-road, S. Croydon—a daughter.

MILLIGAN.—On Sept. 9th, the wife of Dr. Hubert Milligan, Cliftonville, Lytham, of a daughter.

NEELY.—On Sept. 13th, at Vernon House, Lee-road, Blackheath, the wife of Dr. Guy Neely, of a son.

WESTERMAN.—On Sept. 6th, at Snow-hill, London, E.C., the wife of Dr. Arthur Westerman, of a son.

MARRIAGES.

BERRY—ELKINS.—On Sept. 6th, at Watford Parish Church, Dr. Douglas Haycrast Berry, to Mary (Mollie), only daughter of Dr. and Mrs. F. A. Elkins, of Watford.

CORSI—DOYLE.—On Sept. 4th, at St. Paul's, Knightsbridge, Henry Corsi, F.R.C.S., to Margaret Gleaves Doyle, daughter of the late William Gleaves Doyle, F.R.G.S., and Mrs. Doyle, of Walcote, Leamington Spa.

HICKSON—WHITELOCK.—On Sept. 10th, at Whitchurch, Eric Blanford Hickson, M.R.C.S., L.R.C.P., to Joan Frances Whitelock, M.B., B.S., elder daughter of Mr. and Mrs. A. R. Whitelock, of Underwood, Whitchurch.

HILTON-PARRY—WILLIAMS.—On Sept. 10th, at St. Pancras, Dr. William Hilton-Parry, M.C., M.B., B.Ch., of Carnarvon, to Martha Williams, of Merthyr Tydvil.

KEARNEY—GRAY.—On Sept. 2nd, at The Oratory Brompton-road, W., Dr. James Kearney to Kathleen Hilda Gray, daughter of Mr. and Mrs. Frederick E. Gray, of Leyton, Essex.

QUINET—WILLCOX.—On Sept. 9th, at the Parish Church, Solihull, Warwickshire, Paul Gustave Desiré Quinet, M.B., Ch.B., M.R.C.S., L.R.C.P., to Doris Elizabeth Willcox, M.B., Ch.B., B.Sc.

SCOTT—NEEDELL.—On Sept. 12th, at the Parish Church, Hendon, James Bethune Scott, M.C., M.B., Ch.B. Vict., to Leila, only daughter of Mr. and Mrs. T. J. Needell, of Sunningfields-road, Hendon.

DEATHS.

ATTERBURY.—On July 18th, at Monowai, Graham-street, Whangarei, N.Z., Walter Atterbury, M.D., late of Finchley, aged 72.

BIDDLE.—On Sept. 14th, at Wortley, Manorgate-road, Kingston Hill, Daniel Biddle, M.R.C.S., L.S.A., aged 84.

POWER.—On Sept. 7th, at Borrisoleigh, Co. Tipperary, Dr. Joseph Power.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Medical News.

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ROYAL DENTAL HOSPITAL OF LONDON.—A special Children's Department and an extension of the X ray Department are urgently needed to meet the requirements for the treatment of the poorer classes at the Royal Dental Hospital of London. The cost has been estimated at £3000, and in order to help in raising this sum a concert will be held at the Alhambra Theatre on Sunday evening, Oct. 5th, at 7 P.M. Sir Oswald Stoll has given the use of his theatre, and many well-known artists have promised to appear, including Mr. George Robey. The Prince of Wales, who is President of the hospital, has endorsed the appeal on its behalf in an autograph letter. Applications for tickets should be made to the hon. secretary, Lord Burnham's Appeal Fund, at the hospital, 32, Leicester-square, London, W.C. 2.

PROPOSED HOSPITAL FOR DISEASES OF THE HEART IN LIVERPOOL.—An influential meeting has been held in Liverpool to promote a movement for the establishment of a special hospital which would be entirely devoted to the study and treatment of diseases of the heart. The need for such a hospital for Liverpool and the surrounding district has been felt for a long time past by medical men. The meeting was addressed by Prof. Richard Caton, formerly professor of physiology, a former lord mayor of the city and pro-Chancellor of the University, also by Prof. J. M. Beattie, Sir James Paton, and others. It was unanimously resolved to take steps immediately to establish such a hospital. Suitable premises are available and substantial offers of financial assistance were announced and a general committee was nominated with Sir James Paton as chairman. The hospital will be the first of its kind in the district and will provide treatment for both in-patients and out-patients. In Liverpool alone something like 1500 persons are estimated as crippled from cardiac disease traceable to rheumatic fever.

COTTON SPINNERS' CANCER.—Information has been received by the Operative Cotton Spinners' Amalgamation that the Insurance Section of the Master Cotton Spinners' Federation has decided to accept and not to appeal against the "test" case decision at Ashton county court (THE LANCET, August 16th, p. 358) that epithelioma of the scrotum, from which a spinner had died, arose in the course of his employment and therefore falls within the scope of industrial diseases under the Workmen's Compensation Act. It is stated that the decision not to appeal was arrived at on legal advice. There are, according to the operatives' secretary, 100 cancer cases on his books awaiting decision. Much is hoped for—as a result of the publicity given to the case—in the matter of prevention of the disease. The Council of the Amalgamated Association of Operative Cotton Spinners and Twiners suggest that no worthier field in which to work can be found than for scientists by investigation to undertake the task of banishing this disease from all connexion with cotton-spinning. It is suggested that the trade itself, in conjunction with the medical profession, might investigate the cancer-producing properties of mineral oil and direct their efforts to the production of an oil innocent of such properties, or at least to the provision or improvement of preventive measures.

ARSENIC IN FOOD WRAPPERS IN SALFORD.—In his annual report of the borough of Salford for 1923 the borough analyst—Mr. J. D. Elsdon—states that when examining a sample of proprietary bread, it was discovered that the violet ink used for the printing of the wrapper contained appreciable quantities of arsenic. This led to the chemical examination of a large number of coloured wrappers and a number of coloured papers and inks used for printing. Of 51 sample wrapers nine contained an appreciable quantity of arsenic—the colours being two blue papers, five purple, and two green. The quantity of arsenic in one paper faced with a purple colour was about one-third of a grain per square foot of surface. Of nine different samples of printers' ink used for wrappers all were arsenic-free with the exception of one violet ink which contained about 10 per cent. of

arsenic calculated as arsenious oxide. The presence of the arsenic is due to the use of arsenic lakes in the colours from which the printing ink is made. It is alleged that by this means brighter colours are obtained. There is no real reason for their use. As to the milk sold in Salford, it compares favourably with that sold in other districts. With a standard—a lenient one—of more than 5 parts of sediment in 100,000—classified as "adulterated," no sample was so classified after the early months of the year. But the question of dirty milk is one of peculiar difficulty, as the retailer may quite easily remove the bulk of the visible dirt by filtration immediately before selling the milk. There may, however, be serious bacterial contamination, which is the usual concomitant of visible dirt. Out of 26 samples of jam taken and representative of the product of 20 different manufacturers, only seven, prepared by six different manufacturers, had been preserved with cane or beet sugar only. Eighteen samples from 13 vendors contained 8 to 20 per cent. of glucose syrup, while one sample contained as much as 35 per cent. of glucose syrup. Out of 32 samples of golden syrup 22 were found to be genuine golden syrup derived from cane or beet sugar products.

Appointments.

BARCLAY, J. H., M.D. Durh., has been appointed an additional Medical Referee under the Workmen's Compensation Act for the Districts of Gateshead, Hexham and Bellingham, &c.

CHAPMAN, DORA, M.B., Ch.B. Sheff., and ORD, J. W. E., M.D., C.M. McGill, Visiting Anæsthetists to the Jessop Hospital for Women.

GRAHAM, M. J., M.B., B.Ch. N.U.I., Medical Officer, Federated Malay States.

NEGUS, V. E., M.S., F.R.C.S., Junior Surgeon for Diseases of the Throat and Nose at King's College Hospital.

SELLARS, J. A., M.B., Ch.B. N.U.I., Hon. Assistant Physician, Blackburn Royal Infirmary.

THOMAS, B. M. G., M.R.C.S., L.R.C.P. Lond., Superintendent Medical Officer to the Pontypridd Board of Guardians at the Llwynypia Hospital.

WHITELAW, A. D., M.B., B.Ch., D.P.H. Camb., Temporary Assistant School Medical Officer in the Public Health Department of the City of Norwich.

WILLIAMS, H. M., M.R.C.S., L.R.C.P. Lond., D.P.H., Tuberculosis Physician to the County of Carmarthen.

Salford Royal Hospital: MCCAY, A. W., M.B., Ch.B. Edin., DAVIDSON, ALEX. W., M.B., Ch.B. Edin., House Surgeons: STOUT, A. J., M.B., Ch.B. Edin., Casualty House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital, Cheshire.—H.S. £125.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.

Bethnal Green Board of Guardians.—Asst. M.O. £400.

Birkenhead County Borough.—Asst. M.O. £450, res.

Bradford City.—Asst. Bacteriologist. £600.

Bradford Royal Infirmary.—Two H.S.'s and one H.P. Each £150.

Burton-upon-Trent County Borough.—Asst. M.O. £600.

Buxton, Derbyshire, Devonshire Hospital.—Asst. H.P. £150.

City of London Hospital for Diseases of the Heart, Victoria Park, E.—P.

Durham County Council, Maternity and Child Welfare.—Asst. Welfare M.O. £600.

Evelina Hospital for Children, Southwark, S.E.—H.P. £120.

Glasgow, Anderson College of Medicine, Dumbarton-road.—Chair of Surgery.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50. Also H.P. and Asst. Cas. O. £50.

King's Lynn, West Norfolk and King's Lynn Hospital.—Asst. Res. M.O. £150.

Leeds City.—Asst. Clin. Tuberculosis O. £600.

Leicester Royal Infirmary.—H.S. £150.

Liverpool.—M.O.H. £1800.

London Lock Hospital, 91, Dean-street, W.—H.S. £200.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each £50.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Hon. M.O. for Skin Dept. H.P. £125.

Ministry of Health.—Three M.O.'s. £600.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Phys. to Out-patients.

Northampton General Hospital.—Hon. P.

Nottingham General Dispensary.—Res. S. £250.

Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.

Plymouth, South Devon and East Cornwall Hospital.—H.S. and H.P. £100 and £50 respectively. Also Asst. H.S. £50.

Portsmouth, St. Mary's Infirmary, &c.—Third Asst. Res. M.O. £250.

Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P., Each £150. Also Jun. H.S. and H.P. Each £110.

Queen's Hospital for Children, Hackney-road, E.—H.S. £100. Two H.P.'s, Cas. H.S. Each £100. Also P. in charge of Skin Dept.

Rhondda Urban District Council.—Asst. Sch. M.O. £600.

Richmond, Surrey, Royal Hospital.—Asst. H.S. £100.

Royal Chest Hospital, City-road, E.C.—P.

Royal Ear Hospital, Dean-street, Soho.—Reg. £50.

Royal Free Hospital, Gray's Inn-road, W.C.—Med. Reg.

Royal Naval Medical Service.—Surg. Lieuts. 25s. per day.

Royal Westminster Ophthalmic Hospital, King William-street, Strand, W.C.—Asst. H.S.

Seamen's Hospital Society, Greenwich.—H.S. for Albert Dock Hospital. Also H.P. and H.S. at Dreadnought Hospital. Each £150.

Shanghai Municipal Council, Public Health Department.—Asst. Path. £1250.

South London Hospital for Women, Clapham Common, S.W.—H.P. and three H.S.'s. Each £50. Clin. Asst. £1 1s. per attendance.

University College Hospital, Gower-street, W.C.—Res. M.O. £150.

Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.

West End Hospital for Nervous Diseases, Regent's Park, N.W.—H.P. £150.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non. Res. H.S. £150 and £100 respectively.

Westminster Hospital, S.W.—Hon. Asst. Administrator of Anæsthetics.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments:—St. Albans, Herts; Westerham, Kent; Kidwelly, Carmarthen.

Births, Marriages, and Deaths.

BIRTHS.

HEAF.—On Sept. 13th, at Hertford Hill, Warwick, the wife of Frederick Heaf, M.D., of a son.

LEWIN.—On Sept. 9th, at a London nursing home; to the wife of Dr. George Lewin, of 1, Haling Park-road, S. Croydon—a daughter.

MILLIGAN.—On Sept. 9th, the wife of Dr. Hubert Milligan, Cliftonville, Lytham, of a daughter.

NEELY.—On Sept. 13th, at Vernon House, Lee-road, Blackheath, the wife of Dr. Guy Neely, of a son.

WESTERMAN.—On Sept. 6th, at Snow-hill, London, E.C., the wife of Dr. Arthur Westerman, of a son.

MARRIAGES.

BERRY—ELKINS.—On Sept. 6th, at Watford Parish Church, Dr. Douglas Haycrast Berry, to Mary (Mollie), only daughter of Dr. and Mrs. F. A. Elkins, of Watford.

CORSI—DOYLE.—On Sept. 4th, at St. Paul's, Knightsbridge, Henry Corsi, F.R.C.S., to Margaret Gleaves Doyle, daughter of the late William Gleaves Doyle, F.R.G.S., and Mrs. Doyle, of Walcote, Leamington Spa.

HICKSON—WHITELOCK.—On Sept. 10th, at Whitchurch, Eric Blanford Hickson, M.R.C.S., L.R.C.P., to Joan Frances Whitelock, M.B., B.S., elder daughter of Mr. and Mrs. A. R. Whitelock, of Underwood, Whitchurch.

HILTON-PARRY—WILLIAMS.—On Sept. 10th, at St. Pancras, Dr. William Hilton-Parry, M.C., M.B., B.Ch., of Carnarvon, to Martha Williams, of Merthyr Tydvil.

KEARNEY—GRAY.—On Sept. 2nd, at The Oratory Brompton-road, W., Dr. James Kearney to Kathleen Hilda Gray, daughter of Mr. and Mrs. Frederick E. Gray, of Leyton, Essex.

QUINET—WILLCOX.—On Sept. 9th, at the Parish Church, Solihull, Warwickshire, Paul Gustave Desiré Quinet, M.B., Ch.B., M.R.C.S., L.R.C.P., to Doris Elizabeth Willcox, M.B., Ch.B., B.Sc.

SCOTT—NEEDELL.—On Sept. 12th, at the Parish Church, Hendon, James Bethune Scott, M.C., M.B., Ch.B. Vict., to Leila, only daughter of Mr. and Mrs. T. J. Needell, of Sunningfields-road, Hendon.

DEATHS.

ATTERBURY.—On July 18th, at Monowai, Graham-street, Whangarei, N.Z., Walter Atterbury, M.D., late of Finchley, aged 72.

BIDDLE.—On Sept. 14th, at Wortley, Manorgate-road, Kingston Hill, Daniel Biddle, M.R.C.S., L.S.A., aged 84.

POWER.—On Sept. 7th, at Borrisoleigh, Co. Tipperary, Dr. Joseph Power.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Medical News.

Opening of the Medical Schools.—The following functions will be held in connexion with the opening of the undermentioned London Medical Schools:—

St. Bartholomew's Hospital.—Old students' dinner, Wednesday, Oct. 1st, in the great hall of the hospital.

Charing Cross Hospital.—Distribution of prizes by Sir Humphry Rolleston in the out-patients' hall of the hospital, Oct. 1st, at 3.30 P.M. Chairman: Dr. W. Cecil Bosanquet. Annual dinner of past and present students, in the Adelaide Gallery, Gatti's Restaurant, Strand, W.C. 2. Chairman: Mr. Charles Gibbs.

St. George's Hospital.—Prize distribution in large lecture theatre, Wednesday, Oct. 1st, at 3 P.M. Inaugural address by Sir Isambard Owen. Annual medical school dinner, Wednesday, Oct. 1st, at the New Hotel Metropole. Chairman: Sir Isambard Owen.

King's College Hospital.—Prize distribution, Wednesday, Oct. 1st, 2.30 P.M. Inaugural address by Sir David Ferrier. Chairman: Viscount Hambleden. Past and present students' dinner, Wednesday, Oct. 1st, at the Connaught Rooms, Great Queen-street, W.C. Chairman: Mr. Charles P. Childe.

London Hospital.—Old students' dinner, Wednesday, Oct. 1st, at the Trocadero Restaurant, Shaftesbury-avenue, W.C. Chairman: Prof. William Bulloch.

St. Mary's Hospital.—Past and present students' dinner, Monday, Oct. 6th, at the Connaught Rooms, Great Queen-street, W.C. Chairman: Dr. E. M. Callender.

Middlesex Hospital.—Prize distribution in the Queen's Hall, Wednesday, Oct. 1st, 3 P.M., by Lord Birkenhead. Inaugural address by Dr. Charles Porter on Some Aspects of Preventive Medicine. Annual dinner, Wednesday, Oct. 1st, at the Hotel Cecil. Chairman: Mr. G. Gordon-Taylor.

St. Thomas's Hospital.—The annual dinner of past and present students on Friday, Oct. 24th, at Prince's Restaurant, Piccadilly, W. Chairman: Dr. Seymour Taylor.

Westminster Hospital.—Introductory address by Mr. H. J. Waring on the Medical Man of the Future, in the board room of the hospital, Thursday, Oct. 2nd, at 3 P.M.

University of Durham.—At the opening of the winter session of the College of Medicine, Newcastle-upon-Tyne, on Oct. 6th, the address to the students will be delivered by Sir Thomas J. Horder, Bart.

London (R.F.H.) School of Medicine for Women.—This school will celebrate its jubilee in October, in connexion with which the following celebrations will be held: (1) A service of thanksgiving for the opportunities of training, work, and service, open to women in the last 50 years, at St. Paul's Cathedral, on Saturday, Oct. 25th, 2.30 P.M. (2) Dinner in the Guildhall on Friday, Oct. 24th. (3) An evening party at the medical school, Saturday, Oct. 25th.

An attractive pamphlet just issued by this school sets out briefly its history and summarises the progress achieved in the medical education of women since its foundation in 1874. At that time there were only two women in the Medical Register and 14 students at the school. To-day there are about 2000 women on the Register, of whom more than half were educated at this school. To celebrate the jubilee of the school it is hoped to endow chairs in physiology, pathology, and anatomy, to be named after the three great women pioneers in medicine, Elizabeth Blackwell, Elizabeth Garrett Anderson, and Sophia Jex-Blake, of whom charming portraits appear in the pamphlet. Donations to the Endowment Fund should be made payable to Sir Alan Garrett Anderson, hon. treasurer to the school, and addressed to the organising secretary of the Fund, Mrs. K. B. Duffus, 8, Hunter-street, London, W.C. 1.

Queen's University (Belfast) Club, London.—The second dinner of the club will be held in the Hotel Belgravia, Grosvenor-gardens, S.W., on Thursday, Oct. 9th, at 8 P.M. Open to members and to Queen's students and graduates desirous of becoming members. The charge for the dinner will be collected at the occasion. Those intending to be present are requested to notify, not later than Oct. 6th, the hon. secs., at 17, Wimpole-street, W. Previous to the dinner there will be held the annual meeting, beginning at 7.15 P.M.

Summer Time will cease on Sunday next, Sept. 21st, at 3 A.M., when the clock will be put back to 2 A.M. The hour 2–3 A.M. Summer Time will thus be followed by the hour 2–3 A.M. Greenwich Time. Last year Summer Time ceased on Sunday, Sept. 16th.

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Arsenic in Food Wrappers in Salford.—In his annual report of the borough of Salford for 1923 the borough analyst—Mr. J. D. Elsdon—states that when examining a sample of proprietary bread, it was discovered that the violet ink used for the printing of the wrapper contained appreciable quantities of arsenic. This led to the chemical examination of a large number of coloured wrappers and a number of coloured papers and inks used for printing. Of 51 sample wrappers nine contained an appreciable quantity of arsenic—the colours being two blue papers, five purple, and two green. The quantity of arsenic in one paper faced with a purple colour was about one-third of a grain per square foot of surface. Of nine different samples of printers' ink used for wrappers all were arsenic-free with the exception of one violet ink which contained about 10 per cent. of

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THOMAS, B. M. G., M.R.C.S., L.R.C.P. Lond., Superintendent Medical Officer to the Pontypridd Board of Guardians at the Llwynypia Hospital.

WHITELAW, A. D., M.B., B.Ch., D.P.H. Camb., Temporary Assistant School Medical Officer in the Public Health Department of the City of Norwich.

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Durham County Council, Maternity and Child Welfare.—Asst. Welfare M.O. £600.

Evelina Hospital for Children, Southwark, S.E.—H.P. £120.

Glasgow, Anderson College of Medicine, Dumbarton-road.—Chair of Surgery.

Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50. Also H.P. and Asst. Cas. O. £50.

King's Lynn, West Norfolk and King's Lynn Hospital.—Asst. Res. M.O. £150.

Leeds City.—Asst. Clin. Tuberculosis O. £600.

Leicester Royal Infirmary.—H.S. £150.

Liverpool.—M.O.H. £1800.

London Lock Hospital, 91, Dean-street, W.—H.S. £200.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each £50.

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Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.

Plymouth, South Devon and East Cornwall Hospital.—H.S. and H.P. £100 and £50 respectively. Also Asst. H.S. £50.

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Prince of Wales's General Hospital, Tottenham, N.—H.S.'s, H.P., Each £150. Also Jun. H.S. and H.P. Each £110.

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Royal Ear Hospital, Dean-street, Soho.—Reg. £50.

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Royal Naval Medical Service.—Surg. Lieuts. 25s. per day.

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MILLIGAN.—On Sept. 9th, the wife of Dr. Hubert Milligan, Cliftonville, Lytham, of a daughter.

NEELY.—On Sept. 13th, at Vernon House, Lee-road, Blackheath, the wife of Dr. Guy Neely, of a son.

WESTERMAN.—On Sept. 6th, at Snow-hill, London, E.C., the wife of Dr. Arthur Westerman, of a son.

MARRIAGES.

BERRY—ELKINS.—On Sept. 6th, at Watford Parish Church, Dr. Douglas Haycrast Berry, to Mary (Mollie), only daughter of Dr. and Mrs. F. A. Elkins, of Watford.

CORSI—DOYLE.—On Sept. 4th, at St. Paul's, Knightsbridge, Henry Corsi, F.R.C.S., to Margaret Gleaves Doyle, daughter of the late William Gleaves Doyle, F.R.G.S., and Mrs. Doyle, of Walcote, Leamington Spa.

HICKSON—WHITELOCK.—On Sept. 10th, at Whitchurch, Eric Blanford Hickson, M.R.C.S., L.R.C.P., to Joan Frances Whitelock, M.B., B.S., elder daughter of Mr. and Mrs. A. R. Whitelock, of Underwood, Whitchurch.

HILTON-PARRY—WILLIAMS.—On Sept. 10th, at St. Pancras, Dr. William Hilton-Parry, M.C., M.B., B.Ch., of Carnarvon, to Martha Williams, of Merthyr Tydvil.

KEARNEY—GRAY.—On Sept. 2nd, at The Oratory Brompton-road, W., Dr. James Kearney to Kathleen Hilda Gray, daughter of Mr. and Mrs. Frederick E. Gray, of Leyton, Essex.

QUINET—WILLCOX.—On Sept. 9th, at the Parish Church, Solihull, Warwickshire, Paul Gustave Desiré Quinet, M.B., Ch.B., M.R.C.S., L.R.C.P., to Doris Elizabeth Willcox, M.B., Ch.B., B.Sc.

SCOTT—NEEDELL.—On Sept. 12th, at the Parish Church, Hendon, James Bethune Scott, M.C., M.B., Ch.B. Vict., to Leila, only daughter of Mr. and Mrs. T. J. Needell, of Sunningfields-road, Hendon.

DEATHS.

ATTERBURY.—On July 18th, at Monowai, Graham-street, Whangarei, N.Z., Walter Atterbury, M.D., late of Finchley, aged 72.

BIDDLE.—On Sept. 14th, at Wortley, Manorgate-road, Kingston Hill, Daniel Biddle, M.R.C.S., L.S.A., aged 84.

POWER.—On Sept. 7th, at Borrisoleigh, Co. Tipperary, Dr. Joseph Power.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1s. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, Sept. 22nd, to SATURDAY, Sept. 27th.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross. Clinical instruction every afternoon from 2 o'clock. Wed., 5 P.M., Mr. Gimblett: Clinical Demonstration on Common Affections of the Eye. Thurs., 5 P.M., Mr. Morgan: Fundus Class. Fri., 10 A.M., Mr. Hine: Methods of Examination.—INFANTS HOSPITAL, Vincent-square, Westminster. Mon., 2 P.M., Dr. W. E. Robinson: O.P., Chest Cases. 3 P.M., The Hon. Noel Olivier Richards, M.D.: Demonstration, Nursery Hygiene and Clothing. 4 P.M., Dr. Donald Paterson: Congenital Heart Disease, with cases. Tues., 2 P.M., Dr. Eric Pritchard: O.P., Cases of Tuberculosis and Congenital Syphilis. 3 P.M., Dr. Amy Hodgson: Demonstration, Diet from 1 to 5 years. Dr. Bertram Shires: Lectures and Demonstrations: Diagnosis by X rays. Wed., 2 P.M., Dr. Helen Mackay: O.P., Selected Cases. 3 P.M., Dr. Eric Pritchard: Demonstration, Dried Milk. 4 P.M., Dr. Helen Mackay: Pyrexia and its Clinical Investigation. Thurs., 2 P.M., Dr. Donald Paterson: O.P., Special Cases. 3 P.M., Dr. Eric Pritchard: Demonstration, Patent Foods. 4 P.M., Mr. M. S. Mayou: Lecture, The Prophylaxis of Certain Eye Diseases. Fri., 2 P.M., Dr. Eric Pritchard and Members of the Staff: Round Table Consultation. 4 P.M., Dr. Helen Mackay: Lecture, Pyrexia and its Clinical Investigation. Sat., 2 P.M., Visit to the Nursery Training School, Hampstead Garden Suburb, and to Home for Blind Babies, Sunshine House, Chorley Wood.—WESTMINSTER HOSPITAL, S.W. Mon., 10.30 A.M., Mr. W. Spencer: Oral Sepsis. 11.30 A.M., Dr. Hildred Carlill: Clinical Demonstration on Medical Cases. 2 P.M., Mr. A. Evans: Wards and Cases. 4.30 P.M., Dr. Stott: Lecture, Diagnosis of Heart Diseases. Tues., 10.30 A.M., Mr. A. D. Griffith: Ophthalmic Operations. 11.30 A.M., Dr. de Souza: Hormones and Disease. 2 P.M., Mr. W. Turner: Operations. 4.30 P.M., Mr. B. Henry: Dental Radiograms and their Interpretation. Wed., 10.30 A.M., Dr. Braxton Hicks: Pathology, Importance of Detail in Collection of Laboratory Samples by the Practitioner. 2 P.M., Mr. A. Evans: Operations. 4.30 P.M., Dr. E. S. Dore: Demonstration, Skin Cases. Thurs., 10.30 A.M., Mr. G. C. Chubb: Demonstration, Nose, Throat, and Ear Cases. 11.30 A.M., Mr. Stanford Cole: Colostomy. 2 P.M., Mr. Rock Carling: Operations. 4.30 P.M., Dr. A. Stott: Treatment of Heart Diseases. Fri., 10.30 A.M., Dr. A. S. Woodwarke: The Insulin Treatment of Diabetes. 11.30 A.M., Mr. A. Goodwin: Retroversion. 2 P.M., Mr. W. Turner: Operations. 4.30 P.M., Dr. E. S. Worrall: Lecture on High-Frequency Currents and Diathermy. Sat., 11–12.30, Camberwell House, Dr. H. J. Norman: Clinical Demonstration, Mental Disease.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 22nd.—12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards. 2 P.M., Mr. Bishop Harman: Eye Dept.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

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Notes, Comments, and Abstracts.

GOVERNMENT MEDICAL SERVICES IN INDIA.

BY MAJOR-GENERAL SIR PATRICK HEHIR, K.C.I.E., C.B., I.M.S. (RET.).

THE Medical Services in India have been the subject of many inquiries, and are dealt with in the corresponding Blue-books, the Report of the Lee Commission being the latest of these. A ratification of the recommendations contained in that Report as a whole is being called for. The Commissioners themselves, probably prompted by the strained conditions they found during their comprehensive and invaluable investigation, also urge an early decision regarding their proposals. While there is full sympathy with this desire, as far as the medical services are concerned, wisdom may lie in making haste slowly, for here no less than a revolution is contemplated.

For purposes of clearness I set out much that is necessarily known to many readers, but the situation demands a more or less full story.

The Report proposes the introduction of far-reaching changes in the All-India Services on the civil side, particularly in the superior services of Provincial Governments. Medical men are specially concerned with the proposed replacement of the Indian Medical Service by the Royal Army Medical Corps (India), and the creation of a civil medical service on a provincial basis. These are changes which should not be made without much deliberation as to their immediate and ultimate effect on medical work in India. That some modification in the Government medical services in India was necessary has been obvious for the last half century. The desirability of some form of amalgamation of the R.A.M.C. and I.M.S. was prominently brought out in the late war when officers trained in two separate organisations had to work in unison in the field.

It has been contended by Indian politicians and others that in civilised countries under a constitutional government the civil and military services are separate, and they consider that this should be the case in India. It has not been sufficiently recognised that the conditions of the medical profession are complicated in India by circumstances not necessarily present in other countries: there are few grounds for comparison with countries which have a homogeneous population in which the civil medical services can be readily adjusted to meet war requirements, and in which there is only one system of medicine practised.

Schemes for Reform.

A brief review of various Commissions and Committees on this subject should elucidate the present position.

Royal Commission on Public Services (1912–15).—This Commission carried out its inquiry from 1912 to 1915, but on account of the war its Report was not published until 1917, by which time it had become obsolete in many respects. The Report stated: "From inquiries which we have made we are satisfied that under the existing arrangements the civil medical work of the country (India) has hitherto been economically and satisfactorily performed."

Montagu-Chelmsford Reform Scheme (1919).—The reform scheme gave birth to the Government of India Act (1919) which forms the present constitution of India. It introduced vast changes and authorised much wider employment of Indians in the administrative and executive work of the country. The result as far as the medical services of the country is concerned has been to introduce in our medical schools a feeling of uncertainty and insecurity which must be reflected in the numbers of Europeans anxious to undertake a medical career in India.

Verney-Lovett Committee (1919).—This Committee proposed the creation of a unified service, to be known as the Indian Medical Corps, which would discharge all the medical duties in India, civil and military, and would be composed of the existing I.M.S., to which would be added, initially, volunteers from the R.A.M.C., men selected by the Secretary of State for India from the temporary I.M.S. and R.A.M.C. officers that were then serving, and candidates from the medical schools in Great Britain and Ireland to be selected by half-yearly competitive examination in which Indian candidates with Indian qualifications would be given special facilities to compete. This Indian Medical Corps was to incorporate all members of the Indian Medical Department (assistant surgeons and sub-assistant surgeons). Retirement of officers with gratuities after fixed periods of service anterior to pension period was an important and special feature of the scheme. Most of the recommendations of the Verney-Lovett Committee were adopted, but the creation of an Indian Medical Corps, which was the soul of the scheme, was turned down. At the time this was the best all-round solution for a unified medical service; it seemed to meet both the military and civil medical requirements of the country, especially the latter. There are many who still look upon it as the best scheme from all points of view.

Esher Committee (1919–20).—The Esher Committee stated: "We consider that the Verney-Lovett report puts forward the only feasible scheme for a unified medical service, but we feel unable to support that scheme because it would, after the first selection had been made, permanently exclude the R.A.M.C. from India. Such exclusion would adversely affect, especially at the present time, both the large body of British troops in India, whose health has hitherto been so admirably safeguarded by the R.A.M.C., and the service itself, which would be shut out from the wide field of medical experience that India affords. . . . The amalgamation of the I.M.S. and R.A.M.C. is in present conditions impracticable." It suggested improvements in existing conditions, but advised the continuation of the two services as separate units.

Lee Commission (1924).—Regarding the medical services the Lee Commission recommends:—

"(*a*) That while all concessions granted to the All-India Services should be extended to the existing members of the I.M.S. in civil employ, no attempt should be made to perpetuate that service as at present constituted.

"(*b*) That, contrary to the recommendations of the Verney-Lovett Committee that the I.M.S. should be developed into a new Indian Medical Corps which should absorb the R.A.M.C. in India, the medical needs of both the British and Indian armies in India should be provided for, in future, by the R.A.M.C. (India) which should absorb the I.M.S."; the R.A.M.C. (India) is to be formed from the R.A.M.C., ad hoc. Of the British medical men in the civil medical service one-half should be reserved for British officers to be seconded from the R.A.M.C. (India), the remainder being obtained through the (R.A.M.C.) competitive examination held in London. If the number required to complete the authorised establishment cannot be obtained by the local government through the Public Service Commission, the deficiency is to be made up so far as possible by increased seconding of officers from the R.A.M.C. (India), the transfers from the R.A.M.C. (India) to civil would form the war reserve for the army in India.

The Report states: This scheme "is capable of adaptation to meet the requirements of the provinces for a separate medical service and to provide the necessary nucleus of British officers which we regard as vital to the needs and contentment of British civil servants in India." From this it would appear that the Lee Commission found the clamour for an independent civil medical service on a provincial basis so strong that it could no longer be resisted.

The R.A.M.C. (India): The Military Side.

In general terms it may be stated that the formation of the R.A.M.C. (India) would be a re-creation of the I.M.S. in another form. It would, however, be under one organisation, adopt one system of training, its officers would have identical aims, and its position would be one of considerable strength; the old jealousies, friction, and conflicting interests would disappear. It may confidently be expected that a good number of well-qualified young men of the home medical schools desiring an Indian career will join this service with the view to obtaining professional work in the provinces, and when political opinion has settled down they will have a full and useful life. The number of R.A.M.C. (India) officers eligible for civil employ will largely depend upon what the Commander-in-Chief in India declares to be the minimum of medical officers he requires as a war reserve. This is a sound scheme for a military-medical service for India, and if it is made to include the assistant surgeon branch of the Indian Medical Department (there does not appear any adequate reason why it should not) it can hardly be criticised, but it will be costly.

The Civil Side.

The proposals made for the civil side appear to be less satisfactory. The Public Service Commission to be brought into being is the only security that candidates for the essentially civil medical service will have. It is possible that prospective British candidates will not be satisfied with such guarantees as regards security of tenure of appointment as the Public Service Commission can give, while they would readily have sought employment in an *Imperial* Civil Medical Service such as was suggested by Lieut.-General Sir Charles Burtchaell in his note on the Verney-Lovett Committee's Report (App. II., Lee Commission's Report). It is probable that there will be few candidates for an essentially provincial service. This means that in course of time all the civil medical officers not provided through the R.A.M.C. (India) would be Indians, the speed of the Indianisation of the civil medical service being probably much more rapid than is expected in the Report. Many with long Indian experience consider it premature to reduce the number of European medical officers in civil employ. The Lee Commission's proposal would seem to introduce on the civil side too great a change, one for which the indigenous medical profession is not ready. The Report, however, admits the possibility of the adoption of its recommendations lowering the efficiency of the administrations, but considers that the risk should be taken in order to facilitate the logical evolution of the constitutional changes implied in the Government of India Act.

In the medical colleges and the hospitals connected with them the clinical chairs are reserved for provincial medical officers, if suitable men are available; it is possible, even probable, that within the ensuing ten years all these chairs will be filled by Indians. The scientific and research posts are to be thrown open to all candidates, but as there may be little or no competition from the home universities it is likely that these also, in course of time, will be filled by Indians.

Medical Education in India.

This is so supremely important a subject that its general supervision should remain in the hands of the Imperial Government. It is open to many forms of abuse. Some central professional authority should keep a firm hand in regulating and maintaining the standard of that education. The mere fact that the Central Government is the real controlling authority will itself have a potent effect in keeping up a uniformity of standard of the required dimensions. It cannot be too forcibly insisted upon that medical education in India is still in process of development. The standard of medical education will decline in direct ratio to the extent to which European medical men are eliminated from the teaching appointments. If all the medical professorships were handed over to the Indian medical men in the provinces the General Medical Council of Great Britain would soon be obliged to cease to recognise Indian medical qualifications altogether. India should be able to provide the sons and daughters of the soil with a first-class medical education; they should not be obliged to come to Great Britain for it. When colleges and hospitals thoroughly equipped in educational material, and entirely staffed by Indians can give this education, the task of the European professor will have been completed. Many years will elapse before this can happen. It is probable that to obtain a certain percentage of the best European medical men available provincial governments will offer large emoluments, especially in connexion with the teaching appointments in the medical colleges and college hospitals, and some of these will be accepted. These may initially take the form of short contracts. Such an arrangement will be extravagant and unsatisfactory. It will take some time for a new-comer to reach a maximum degree of usefulness, and when he becomes most efficient he may, for one reason or another, elect to relinquish his appointment.

The Indian Medical Service.

In the second half of the nineteenth century the Indian Medical Service was *facile princeps*, the best medical service in the world—a veritable *corps d'élite*. During that period it was recruited from the pick of the medical schools of the United Kingdom. The origin of that service in point of time practically coincides with that of our occupation of India, and it has a splendid record of devoted service to the people of that country. In late years the British candidate appointed to the I.M.S. went out to India with prospects greatly depreciated, chiefly on account of the hostility to the British element; this has been revealed in the debates of the Central and Provincial Legislative Assemblies, on political platforms, and in the press controlled by Indians. In the capital towns of several provinces there has been a boycott of I.M.S. Europeans from consulting practice, and European civil surgeons have found patients prevented from attending their hospitals by men specially posted for that purpose. It is only by recognising that all this is part of a political programme that it has been bearable.

The hope of obtaining civil employment has always been the determining factor that induced men to enter the I.M.S. But the civil side alone would not have lured the best young men from home. The military side has added to the fascination of the I.M.S. It was the combination of a commission in His Majesty's Army with the prospect of field service, together with unrivalled opportunities for a professional life, that attracted the superior men of the home medical schools to the I.M.S. India on the civil side requires the highest class of European medical men now more than ever if the fine edifice of Western medical science, which has been created by over a century of effort on the part of the I.M.S., is not to topple to the ground.

Medical Treatment of Europeans.

One great cause of anxiety among European officials in India is the decreasing possibility of obtaining medical advice for themselves and their families from doctors of their own race. This is a matter of the greatest importance if European officers are to be contented. Growing Indianisation and the large areas to be covered has made the provision of such medical advice more and more difficult. The solution of this problem by the Lee Commission seems the best possible one in the circumstances. Districts or provinces are to be grouped and a British medical officer (civil or military) is to be posted to one station in each group. The station should be easy of access. In stations where there is no British medical officer facilities are to be given for either the officer or his family to visit the medical officer or vice versâ, Government meeting the travelling expenses. Where only military medical officers are present they are to be made use of and receive the usual fees. Hospital accommodation for sick European officials and their families at the group station and in the larger hill stations would complete this solution of the problem. It may be that from the present situation in India the proposal of the Lee Commission is the only way to ensure there being a sufficient number of European medical men in India to give advice to the Europeans in the country. It is presumed that the Government is bound within certain limits to afford medical attendance to all its European employees by medical men of their own race. Neglect to do this will cause such dissatisfaction as will materially affect recruitment of Europeans for all the services. Endeavours should be made to strike the happy mean of maintaining a sufficient number of European medical officers for our military and civil services in both peace and war, and yet deal in an absolutely just and sympathetic way with the legitimate aspirations of Indians to hold their due place in the medical organisation of the country.

Action Required, but not Haste.

If the Lee Commission's proposals regarding the medical services are to be carried out it is suggested that it be done gradually. Whilst undue haste in arriving at decisions is to be deprecated, it is earnestly hoped that the Report will not share the fate of some of its predecessors by becoming obsolete before any action is taken. Political opinion is shifting rapidly in India. Many serious questions hang on the decisions, settlement of some of which is long overdue.

JAIL ADMINISTRATION IN BENGAL.[1]

THE report for 1922 commences with a short account of two mutinies that occurred in the Presidency Jail, one in April and the other in October, 1922. In the first outbreak, which was of a serious nature, 9 convicts were killed and 47 wounded, while of the jail staff one warder died from injuries received, and 36 other warders or members of the staff were injured; 14 convicts escaped, of whom 7 were subsequently captured, and the jute and oil godowns were set on fire and seriously damaged, with considerable loss of raw materials and manufactured articles. Several hundreds of political prisoners were admitted in December, 1921, and at one time there were 1400 non-coöperator and Khilaphat prisoners, in addition to the ordinary jail population. "It can thus be seen that it was impossible for the staff to cope with the enormous amount of extra work entailed. It was a time of great stress and anxiety for all concerned; the jailer and his assistants were never off duty, and great credit is due to their patience with this troublesome class of prisoner. Intense propaganda was spread among the Indian warders and seriously affected their morale." Fire had to be opened on the convicts, and troops called in to aid the jail staff. The second mutiny was not so serious, and there was no loss of life. Lieut.-Colonel W. G. Hamilton, I.M.S., Officiating Inspector-General of Prisons, Bengal, who presents this report, refers to the expression of opinion by Government of India "that non-criminal lunatics should not be committed to jail, and that criminal lunatics should not be detained in jails a day longer than is necessary." In future non-criminal lunatics belonging to Calcutta and its suburbs will be accommodated in the Bhawanipur Mental Hospital; and those belonging to Dacca and Murshidabad districts will be sent to the mental hospitals in those districts instead of to jail. "In other districts the jails must continue to take in non-criminal lunatics, a most undesirable practice." Government have sanctioned the creation of a new class—"special class prisoners," to be certified as such "on account of status, education, and character of the offence," who will be accorded special treatment at the Berhampore district jail.

The total admissions to jail, including transfers, numbered 84,985 in 1922 and the average daily strength was 15,220, as compared with 83,366 and 14,661 in 1921; the convicts numbered 43,945 admissions (including transfers), the average present being 12,512; the corresponding figures for 1921 were 42,998 and 12,211. Of the total number of convicts admitted (28,655, as stated in para. 8), 58·3 per cent. were Mahommedans, 38·7 Hindus, the remainder including Christians, Buddhists, and Jains. The Bengal Children's Act was passed during the year under review, making imprisonment illegal for children under 14 years of age, and for young persons under 16, unless under exceptional circumstances. "Unfortunately, this Act cannot be enforced owing to lack of funds for providing the necessary institutions and probation officers." The total earnings of all the jails (except the Presidency jail, the accounts of which are not forthcoming) amounted to Rs.6,81,199, giving an average per head (of those sentenced to labour) of Rs.56·6. At the Juvenile jail at Alipore, the chief industry is the manufacture of quinine tablets; 905,685 treatment tubes (each containing 20 4-grain tablets) were sold, realising a profit of Rs.1,64,207. The net earnings of the district jails amounted to Rs.2,70,926, as compared with Rs.3,45,156 in 1921. Of this total the Juvenile jail gave the best results, with an average earnings per head by those employed of Rs.1862.

In regard to the health of the prisoners of all classes in 1922, the daily average population being 15,220 (of whom 12,511 were convicts), the admissions to hospital averaged 1230 per 1000, the constantly sick 43·0, and the deaths 18·7; the daily average sick ratio was lower than in any of the four years preceding, during which it had fallen satisfactorily from 57·4 in 1918 to 45·1 in 1921. Among convicted prisoners in 1922 these three ratios were 1249·5, 31·2, and 19·1 respectively. The death-rate (18·7) was higher than in the previous year (16·0), but lower than in the years 1918–19–20, when it had been 21·3, 22·9, and 20·9, respectively; although not so low as in 1921 it was better than the five-year average, and Lieut.-Colonel Hamilton considers it to be "quite satisfactory." There were 35 cases of cholera and 16 deaths, as compared with only one case (not fatal) in 1921; at Mymensingh in Dacca division there were 22 cases and 10 deaths; and at the Presidency jail, Calcutta, there were 9 cases and 5 deaths; here the infection was probably introduced by "carriers," as the disease was prevalent in the city at the same time. The common jail scourge, dysentery, caused 1510 admissions to hospital and 39 deaths among convicted prisoners, giving ratios of 120·6 and 3·1 per 1000 respectively, as compared with 106·6 and 2·5 in the previous year. The admission ratios were highest at Chittagong (602·6) and Barisal (474·4), and the death-rate at Jalpaiguri was 15·7; it is noteworthy that in 17 jails not a single death from this cause occurred among convicted prisoners, a striking testimony to their general sanitation and good management. In conclusion, Lieut.-Colonel Hamilton states that "all jailers had a trying time during the past year, and much praise is due to them for the loyal way in which they carried out their arduous duties."

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[1] Bengal Secretariat Book Depôt, Calcutta, 1923.

A HELP TO TRAVELLING PHOTOGRAPHERS.

To tourists or travellers devoid of the convenience of a dark room, the "tabloid" desensitiser just put on the market by Messrs. Burroughs, Wellcome and Co. will be of service. The action of the desensitiser is to remove a great proportion of the sensitiveness of the emulsion without destroying the latent image created by exposure. With its use, after one minute's treatment in the dark, development can be completed by candle-light, or (in the shadow of the body) in a room lighted by gas or electric light; and even ultra-sensitive and colour plates can be developed with care by candle-light or dim gas-light. Panchromatic plates can be developed in a comfortable light. The desensitiser is issued in cartons of 25.

COMPENSATED DISABILITY.

WE have received from Messrs. W. R. Grossmith, Ltd. (12, Burleigh-street, Strand, London, W.C.2), a small pamphlet entitled "Nature Reproduced," in which are recorded some of the achievements of amputees who use the artificial limbs of this well-known firm. The merits of the "Anglesey" pattern artificial leg, which has been in use in this country since the middle of the last century, have long been known, but have been perhaps unduly overshadowed by the successes achieved by American types, especially those modified and improved by British makers during the war. Nevertheless, the fact remains that "Anglesey" legs, when properly made and fitted, can be as light as or even lighter than any other limb upon the market, whether made of metal, leather, wood, or composition, and their wearers have achieved notable successes in walking competitions and have taken part in all manner of sports and occupations. Recognition of the merits of any one type of limb by no means implies condemnation of other types.

Some Principles
OF
TREATMENT IN THE
RADIO-THERAPEUTICS OF CANCER.

BY FRANCIS HERNAMAN-JOHNSON,
M.D. ABERD.,
RADIOLOGIST TO THE FRENCH HOSPITAL, LONDON; MEDICAL OFFICER IN CHARGE, X RAY AND ELECTRICAL DEPARTMENT, CROYDON GENERAL HOSPITAL, ETC.

I.

THE present would seem to be a suitable time to try to set forth some guiding principles for the radiotherapy of malignant disease. As often happens, it appeared much easier in earlier days to formulate such principles than is the case to-day. Ten years ago the simple faith of most of us, myself included, was that the secret of progress lay in finding means to irradiate a deep-seated tumour thoroughly without damage to the skin. For my own part, I always recognised that the tissues surrounding a growth played an important part in its cure, and that it was possible to stimulate them by X rays, while at the same time depressing the tumour cells. Nevertheless, I believed that the harder the ray the better for both purposes.

Let us consider this view and examine how far it will carry us.

The introduction into this country of X rays generated at 200–230,000 volts, filtered through 10 millimetres of aluminium or its equivalent, dates back to the year 1921; and at a discussion at the Royal Society of Medicine in March last (1924) we got a representative summary of the results. Disappointment was the keynote of most of the remarks. Many speakers frankly stated that the new methods were in their opinion no better than the old. I do not forget that the "new rays" were applied according to a new technique, and that it may be argued that this technique does not make the best use of them. But I have, myself, had an opportunity of comparing the results of rays generated at 160 kilo-volts with those from a 230 kilo-volt machine, the same technique being used in each case. I had been able to discover no difference in the results in pelvic cancer—the same temporary miracles being accomplished in both cases; and in breast cases it appeared to me that the longer wave-length had a rather better effect. A four-day dosage was adopted in both instances, and the filtration was the same. The skin dose was also equal, but the "depth dose," of course, reached a less intensity in the one case than in the other. Very similar results were reported from America in 1921 before European apparatus arrived there, a four-day dosage being used at 120 to 130 kilo-volts. It would be, of course, idle to deny that for pelvic growths a hard filtered ray is necessary, and there must be a limit below which efficiency falls rapidly. But, despite theoretical considerations regarding "percentage depth dose," it is doubtful if the very high voltages show any advantages in actual practice.

When we come to breast cancer, the Erlangen results are admitted to be disappointing, and curious attempts—which, to the writer's mind, savour of imitative magic—have been made to turn them artificially into deep-seated tumours by wax blocks—in order that the conditions present in uterine carcinoma may be reproduced! Now, it is a well-known fact that in former days excellent effects have been obtained in carcinoma mammæ by rays generated at about 100 to 120 kilo-volts with 2 millimetres of aluminium as a filter. Clinical evidence does not support the view that in breast cancer there are any advantages in very hard rays.

Sometimes one's faith in the whole principle of penetration receives a jar. Some years ago an old lady of 70 was sent to me suffering from a large ulcerating epithelioma of the thigh. She had had radium treatment, which at first did good, but finally seemed to make things worse. The friends were averse also to X rays, which, rightly, they regarded as closely akin to radium. More as a placebo than for any other reason, I decided to try rays from a tungsten arc. The thickened edge rapidly flattened out, and the whole ulcerated surface healed within a few weeks. There was already secondary mischief within the pelvis, and the patient died shortly afterwards—killed, her friends firmly believe to this day, by the unwise proceeding of closing her ulcer! This by the way. The point of interest is that the epitheliomatous tissue must have been at least a quarter of an inch in thickness, and therefore for the most part impenetrable to ultra-violet rays. Yet they caused it to disappear where radium had only produced irritaiton.

I made a statement in 1916, I think, to the effect that ultra-violet rays could not benefit exophthalmic goitre "because they had practically no penetration"; and one sees similar statements to-day. But I now cry peccavi. The only proof we can have that any therapeutic measure is of benefit is that in the first place improvement follows treatment in a large percentage of cases—a percentage high enough to exclude the possibility of what we call coincidence. This broad fact must first be established. Then suggestion must be excluded, and, so far as possible, extraneous physical factors. By the latter I mean, for example, fresh air, when one is estimating the benefits of natural sunlight, and change of scene and diet when considering the effects of mineral waters. When every care has been taken along such lines, we should never say that it is impossible that such and such measures should have effected a cure, because this appears to be incompatible with some *present* scientific belief. Over and over again clinical evidence has been discounted on such grounds, while later investigation has furnished a simple explanation. When chemical analysis had reached great exactitude certain mineral waters, which were said to lose some of their virtue when bottled, were examined, and it was found that their chemical composition remained constant for years; it was, therefore, declared impossible that their effects, if any, should differ from those produced at the actual spa. Later, it was shown these waters are at their source charged with radium emanation (*niton*); and this, of course, disintegrates within a few days.

At the present time one often sees it denied that certain very high dilutions of drugs can produce any physiological effect "because most of the doses would not contain a single molecule of the substance." But already some active substances are admitted to be potent in fractions so minute that only a few years ago the possibility of their producing any physiological effect would have been laughed at. The clinical test is alone of value. There is no difference between post hoc and propter hoc except a numerical one. All the above is somewhat of a digression, but it is vitally necessary in a subject such as radiology, in which the study of physical science is essential, that we should beware of denying clinical facts because of physical theories.

To return to our subject-matter, not only do we find ultra-violet rays successful in cases which have resisted those of shorter wave-length, but the converse is true. There are authenticated cases of burns caused by soft X rays, in which a cure has been effected by gamma rays, and even by hard filtered X rays. Such apparently paradoxical effects are possibly associated with the phenomena of "physiological interference" (Leonard Hill). The action of ultra-violet rays, for example, is modified if red light is at the same time caused to fall upon the skin area exposed.

We are now in a position to formulate two principles: (1) The wave-length most suitable for any given type of growth must be found by clinical observation, and cannot be deduced a priori from any physical considerations. (2) If an injury is inflicted by rays of a given wave-length the lesion may in some cases be cured or mitigated by rays of a widely differing wave-length.

II.

We next come to the postulate that if only sufficient rays can be concentrated on to a malignant growth it will be killed; or, to put the belief in a milder form, that the best attainable results are always to be achieved by such a concentration. As regards pelvic growths, techniques of great ingenuity have been elaborated with a view to accomplishing this object. Multiple ports of entry have been long in use, but the rotating tube of Knox undoubtedly enables the idea to be carried out with the maximum of completeness. The theory itself is, however, open to serious criticism. In the first place, it has been proved beyond a doubt, and was admitted at the discussion above referred to, that even rodent ulcer cannot be killed with certainty by any dose of rays short of what is necessary to cause necrosis "en masse"—i.e., unless the rays are used frankly as a caustic. Owing to the impossibility of limiting effects in the depth, such use is, of course, not justifiable. On the other hand, small repeated doses are often quite successful in causing healing.

It will, I think, be generally admitted that a rodent ulcer does best when a fairly wide margin of apparently sound tissue is included in the irradiated area, and when a smart, but not too intense or prolonged, reaction is produced. That a therapeutic up-stirring of the surrounding tissues plays a large part in the cure of *any* cancer is a truth which is slowly gaining the recognition it deserves.

The laboratory observation that a cancerous tumour can be killed in vitro by radiation has limited the progress of clinical radiology. But this is not the fault of the experimenters. For they have also shown that the dose required to kill in vitro is vastly greater than that required to cause disappearances in vivo; also that previous irradiation of a proposed inoculation site reduces very greatly the likelihood of a "take." They have also proved that mild general raying increases resistance to cancer grafts, whereas heavy raying diminishes it.

The search for the cancer dose—the *therapia sterilizans magna*—reminds one of the attitude of many surgeons to the antiseptic dressing of wounds. The search for the ideal antiseptic has gone on for years, and every now and then its discovery is announced. But the results never come up to expectations. The reason is that in most cases antiseptic solutions act as stimulants to the wound rather than as direct killers of germs; and, therefore, are often of most use in solutions so weak as to be quite incapable of any direct lethal action on bacteria. When it was proved that ultra-violet rays could kill germs in vitro, the announcement caused great enthusiasm—an enthusiasm which was damped by the further discovery that this action was prevented by a layer of tissue having a thickness of only a fraction of a millimetre! Yet there is no doubt but that exposure to ultra-violet rays can cause the healing of wounds when the infection is of considerable depth. As Leonard Hill says, the healing is due to an indirect stimulation and is not the result of bactericidal action.

Embryonic cells are specially sensitive to X rays; malignant cells show certain embryonic characteristics; hence malignant cells in the body can be killed by a dose of X rays which will be harmless to normal cells. This imperfect syllogism is the basis of cancer-dose idea, and is analogous to the belief that infected wounds can be healed by an ideal antiseptic which will kill all the bacteria without injuring the body cells. There is, of course, an element of fact in both, but we should beware of being obsessed by one aspect of a truth. That X rays do exert a certain amount of direct action upon neoplastic cells is undoubted; but its amount is peculiarly incalculable, for a tumour should be regarded from a dynamic and not from a static aspect. By this I mean that clinical and microscopic similarity between two tumours at any given moment offers no proof, hardly even a presumption, that they will react in an identical manner to a given dose of radiation. For we know that X ray effect upon growing cells is determined in part upon their degree of activity at the time of application. We cannot gauge this factor when attempting to compare one tumour with another, and thus we can scarcely expect to be able to secure identical results in all patients by a standardised dosage. A malignant tumour is not the inert mass which it looks to the eye, nor are its cells truly represented by the set patterns seen in a "fixed and stained" microscopic preparation. Each cell in the tumour is alive: sometimes resting, sometimes plunging into an orgy of reproductive activity. Let us contemplate this picture with due humility, and beware of attempting prematurely to apply simple mathematical formulæ to complex and imperfectly understood biological processes.

It may be argued that although we can never hope to know beforehand the minimum dose for each tumour, yet a dosage can be administered which will always be the maximum ever required. But clinical experience has now shown that no dosage which it is practicable to administer can ensure that all cancer cells are killed.

This being the case, we have to think very carefully about the surrounding tissues. Cross-fire cannot be limited strictly to the tumour. We do not know its exact size and shape; and it is in the nature of things that the various beams must pass on, still powerful, into the tissues on that aspect of the tumour which is, for the time being, remote from the tube. In other words, it is impossible to concentrate upon the tumour—or, at any rate, upon its periphery, which is the part that matters most—a dose less than that which is received by the parts immediately surrounding it. On these much depends. Hence, for the crude idea of a purely destructive "cancer dose" should be substituted the following principle: *The amount of radiation which is concentrated upon a tumour should not exceed the maximum consistent with the production of a healthy reaction in the surrounding tissues.*

Assuming that, in a particular case, a concentrated dosage has been decided on, is the concentration in space to be paralleled by a similar concentration in time? In other words, is the maximum permissible dose (as clinically determined in accordance with the principle just laid down) to be delivered in one day or spread over several consecutive days? The former method is chiefly associated with the Erlangen school. It is admittedly hard on the patient, may in some cases be fatal; and, whatever the ultimate benefit, causes the appearance of a negative phase, during which the patient shows increased susceptibility to metastatic invasion. What are the arguments used by those in favour of the single dose?

1. They say that the dose required to cause sterilisation in the female has to be very considerably increased if the exposure is made over a period of some days.

This argument is beside the point, for two reasons. In the first place, the effect of X rays upon the reproductive cells is directly destructive. The action of the surrounding tissues does not come in at all. In the nature of the case it cannot, as the reproductive cells are normal to the body. But the cure of cancer by radiation is a subtle mingling of inhibition with stimulation. As we have seen, it is not possible to kill cancer cells by a mathematically calculated dosage, and there is no true analogy between X ray action upon the ovarian cells and upon those of a malignant tumour. In the second place, the mere fact that the dose required to produce a given effect is greater, in sum, when spread over a few days, has no bearing upon the merits of the case. *If the same effect can be produced in one of two ways, that which upsets the patient the least is obviously to be preferred.*

2. There is the argument that, with any division of the dose, there is a risk of actually stimulating the growth. To controvert this is, perhaps, already akin to flogging a dead horse; yet the idea still crops up

occasionally in unexpected quarters. The belief is based on theory alone—for the amount of so-called clinical evidence is so small that, were an equal amount brought forward to prove some benefit, it would be justly dismissed as coming well within the limits of coincidence.

That apparent stimulation of a growth may occur after too intense or too long-continued radiation is true; but this is due to a breakdown of resistance, and is not a true stimulation. We find, in point of fact, that in the two malignant conditions most easily observed—namely, rodent ulcer and cancer of the breast—very small doses cause improvement or even apparent cure. If small quantities of radiation are really dangerous, then the upholders of the stimulation theory have proved too much; for no cases other than those in which the exact size, shape, and position of the growth are known should ever be treated. Otherwise, how shall we know what quantity of rays may reach some outlying spur or metastasis, exciting it to fatal activity? Thus, we see that this particular bogey carried to its logical conclusion ends in a reductio ad absurdum.

III.

The method of concentrated cross-fire is applicable only in the case of tumours of moderate size, the position of which is believed to be known; and when it is assumed that there are no metastases. About the only instance in which these conditions are reasonably fulfilled is an early carcinoma of the uterus, more particularly of the cervix. Of such a nature are the cases on which the Erlangen claims to success are chiefly based; but in those which come into the hands of British radiologists the conditions are far otherwise. In the inoperable case, and in the post-operative recurrence, the disease is no longer limited in extent; consequently, only a wide distribution of radiation can be of avail. Not only so, but surgeons of the school of Mr. Sampson Handley are of opinion that *all* radiation treatment should be as widespread as possible, made to include the microscopically invisible lymphatic invasion, which they say spreads centrifugally from the primary tumour. Whether or not radiation treatment should *always* be widely distributed I do not feel competent to say; but it is, at least, certain that in 90 per cent. of the cases we see in England it is the only method by which we can hope to deal effectively with the disease.

This being admitted, we have to consider very carefully the question of *general effects*. A given exposure below the diaphragm causes more disturbance than the same dosage above; various ductless glands have also to be considered; but, other things being equal, the constitutional upset is proportional to the skin area exposed. This is a matter of clinical experience, and is to be correlated, at least in some degree, with the volume of blood which is irradiated.

In the case of widespread disease, it is impossible to dose the whole area with an intensity which might be safe enough if given over a more limited space. It may be desirable to include a large part of the abdomen, both from the back and from the front; and to give the unit skin dose of the Erlangen school in a single day upon such an area would in all likelihood be fatal to the patient. The area must be contracted, or the skin dose must be reduced, or the time must be greatly extended. From these alternatives there is no escape.

As a corollary to the maxim that concentrated dosage, if given, should not exceed that which is capable of producing healthy reaction in the tissues round a malignant growth, we need to add that *radiation treatment, given by whatsoever method, must be attuned to the estimated power of constitutional response in the individual patient.* A certain amount of disturbance, local or general, is not, of course, an indication of over-dosage, any more than is that which follows successful treatment by a vaccine. But just as the skilful vaccine-therapist seeks to avoid violent reactions in general, and, in the case of feeble patients, errs on the side of caution, so the wise radiologist will be chary of reactions in his stronger patients, and avoid them altogether in those of low vitality. That there is a close analogy between the action of X rays in microbial diseases and that of vaccines is undeniable. They seem to help the body to produce suitable antitoxins, irrespective of the particular organisms. The present tendency of bacteriologists to modify their views as to the specificity of vaccines makes this the more probable. Medicine is an organic whole, and it will pay the radiologist, although he cannot hope to master details, to follow the general trend of modern clinical bacteriology. The problems of immunity, the production of negative and positive phases, and, lastly, of anaphylaxis, can be neglected only at grave peril to the progress of radio-therapeutics.

This is perhaps a suitable place to refer to the effects of potassium in various forms. From time to time cases are published which seem to indicate that this element has some beneficial effect on malignant growths. This, at least, is certain: that in the case of pathological fibrous tissue, such as keloid, Dupuytren's contraction, &c., the exhibition of potassium may produce precisely the same effect as X ray exposures. Of this I can speak from personal observation. We find X rays producing in various cases results which may be obtained in other ways—e.g., by arsenic or thyroid in psoriasis; by vaccines in acne or tubercle; by potassium in keloid, and possibly in cancer. This chaos is, we may be sure, apparent only, but its existence is sufficient to show that the problems of radio-therapeutics cannot be divorced from those of medicine in general.

IV.

So far we have been dealing for the most part with what may be classed under the general head of intensive therapy—i.e., treatment extending over not more than a few days, followed by an interval of at least several weeks. Such treatment is inevitably accompanied by at least some disturbance—which may, however, be very slight in people whose general health is still fair. But it is quite possible, and, indeed, was formerly the custom, to treat malignant cases without producing any apparent reaction. The small dose, repeated two or three times a week for perhaps two months, will cause shrinkage or disappearance of some cancerous tumours, notably of the breast. The general health improves pari passu, and this benefit is noticeable very early, sometimes after the first week.[1]

I have already referred to the experiments of Russ in this country, and of Murphy and Bainbridge in America, to the effect that a considerable degree of immunity to cancer grafts can be produced in rodents by suitable irradiation, whereas an excess lowers or abolishes resistance. The sense of well-being which accompanies suitable divided dosage in human beings, combined with the fact that nodules outside the area irradiated sometimes disappear, give ground for the belief that a similar phenomenon occurs in man. At any rate, the clinical results of this method are such that we are not justified in resorting to anything more drastic in the case of the old feeble, or when attempting to render an inoperable case operable. This statement requires some modification, in that, should mild measures fail, one ought to try others, even at some immediate risk. For prophylaxis the divided dosage should always be used.

V.

Reference must now be made to what may be termed the constitutional side of the therapeutic problem. The broad fact is that patients in good general health respond the best, whereas those in a cachectic state sometimes fail to show even temporary benefit. Whatever is the nature of cancer, whether it is a germ disease or a biological "throw-back," we know the body unaided resists its progress—often by rays of a given wave-length the lesion may in some cases be cured or mitigated by rays of a widely differing wave-length.

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[1] When I speak of small doses I mean doses of the order of 2 m.a., 30 cm. antikathode—skin; 3 mm. aluminium filter; 140–160 kilo-volt; time, 10 min. The largest possible diaphragm is used, so a skin area at least 1 ft. in diameter is exposed.

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I have already referred to the experiments of Russ in this country, and of Murphy and Bainbridge in America, to the effect that a considerable degree of immunity to cancer grafts can be produced in rodents by suitable irradiation, whereas an excess lowers or abolishes resistance. The sense of well-being which accompanies suitable divided dosage in human beings, combined with the fact that nodules outside the area irradiated sometimes disappear, give ground for the belief that a similar phenomenon occurs in man. At any rate, the clinical results of this method are such that we are not justified in resorting to anything more drastic in the case of the old feeble, or when attempting to render an inoperable case operable. This statement requires some modification, in that, should mild measures fail, one ought to try others, even at some immediate risk. For prophylaxis the divided dosage should always be used.

V.

Reference must now be made to what may be termed the constitutional side of the therapeutic problem. The broad fact is that patients in good general health respond the best, whereas those in a cachectic state sometimes fail to show even temporary benefit. Whatever is the nature of cancer, whether it is a germ disease or a biological "throw-back," we know the body unaided resists its progress—often for years, occasionally with permanent success. In cases which are rapidly going to the bad—in which, apparently, resistance is almost exhausted—we may sometimes by suitable X ray treatment produce a miraculous restoration to apparent health, which is usually only of a few months', but may be of some years' duration. Sooner or later, there is only too likely to occur a sudden and complete "going to pieces"—death occurring sometimes as the result of recurrence at the original site, but more often from widespread and rapidly growing metastases. The power of resistance seems to come to an abrupt end. A somewhat similar phenomenon sometimes occurs in tubercle. When this rapid collapse sets in, further X rays are, as a rule, useless; nor does experience so far lead us to hope that heavy dosage in the interval will avert such disasters.

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[1] When I speak of small doses I mean doses of the order of 2 m.a., 30 cm. antikathode—skin; 3 mm. aluminium filter; 140–160 kilo-volt; time, 10 min. The largest possible diaphragm is used, so a skin area at least 1 ft. in diameter is exposed.

It has been suggested that those malignant cells which are not killed in the first attack may acquire immunity to further dosage, and transmit this to their descendants. The question of inheritance of acquired immunity is a somewhat vexed one. It is perhaps simpler to assume that certain cells by reason of variation, or even of mutation, have inherently a higher resisting power; that these alone survive, and their descendants inherit the favourable character. It should also be noted that the immunity may be against the means of attack possessed by the body—which mechanism is stirred into activity by X ray treatment—rather than against any direct effects of the radiation. This is not merely a "distinction without a difference"—it has an obvious bearing on the lines which research should follow.

It has seemed desirable to mention this view of the tumour becoming immune to X rays; but, to the present writer, it appears more probable that death results from a failure of resisting power, local and general. If the tumour mass is reproduced from immune cells, one would expect trouble to begin very soon after the treatment, and to progress steadily—unless one assumes that the malignant cells lie paralysed for a long period, and then leap into furious activity. Even this somewhat far-fetched hypothesis will not suffice, unless we also assume that all the metastatic deposits are started after the latent period—an assumption very hard to reconcile with clinical facts.

Let us consider a typical case illustrating the measure of success, followed by final failure, which can be paralleled from the case-books of any experienced radiologist. A patient is seen, let us say, in January fast dying of pelvic cancer. She has a few days intensive treatment, and in two months she has put on 20 lb. in weight and returned to her ordinary occupation. Examination at the end of April reveals only slight traces of palpable disease.

It would appear that the patient is in a much more favourable condition for X ray treatment than when she first came. Yet, whatever is done in that way, she may be dead before the end of the year. Occasionally it is not so, and a second restoration may occur, or an interval treatment may appear to postpone the final collapse. Generally speaking, however, a repetition of the treatment gives disappointing results, and may even appear to do harm. In the latter case X ray anaphylaxis, which appears really to exist, may explain the failure—but this cannot account for all cases. Our patient, so desperately ill in January, yet had then some power of response which, unrecognisably better in April, she had nevertheless ceased to possess.

The failure of our efforts to take advantage of the "period of grace" in such cases to consolidate the ground won, and to use it as a basis for further advance is, perhaps, the greatest disappointment of modern medicine. Yet our experience with rodent ulcer, which extends over a quarter of a century, should have warned us of what to expect. Almost all rodent ulcers can be made to disappear once by X rays; sometimes twice. But such as recur once recur again, and are rarely amenable to a third course of treatment. They become "immune" or—as I prefer to put it—the surrounding tissues lose the power of response. It is my practice never to treat a recurring rodent ulcer again with X rays alone. But if the visible growth be destroyed by the curette, X rays will induce rapid healing of the wound. The mechanical stimulus of scraping, the flushing with fresh blood, &c., appears to restore the capacity of the tissues to react. The same result may sometimes be accomplished by first ionising with zinc or copper.

Recent work on vaccine therapy tends to show that in many cases injections act best if made within the tissues which are the actual seat of disease. For example, in the case of pyorrhœa, subcutaneous injections produce some benefit, but if the gum is chosen as the site, the effect is much more pronounced. It is assumed that the invaded tissue is capable of a special resistance over and above that offered by the body in general. Now, it would appear that the resistance to cancerous growth is also local and general. A rodent ulcer has no tendency to metastasis, and therefore, in treating it, we are chiefly concerned with local resistance. Breast and uterine cancers call for an opposition both local and general.

In the case of deep-seated tumours, attempts at local "resensitisation" must at present be empirical. They are limited to the passing of diathermic currents or heavy continuous currents through the site of the growth, and the injection of colloidal metals in such a manner that they reach the general circulation. Blair Bell's experiments with lead should be kept in view in this connexion.

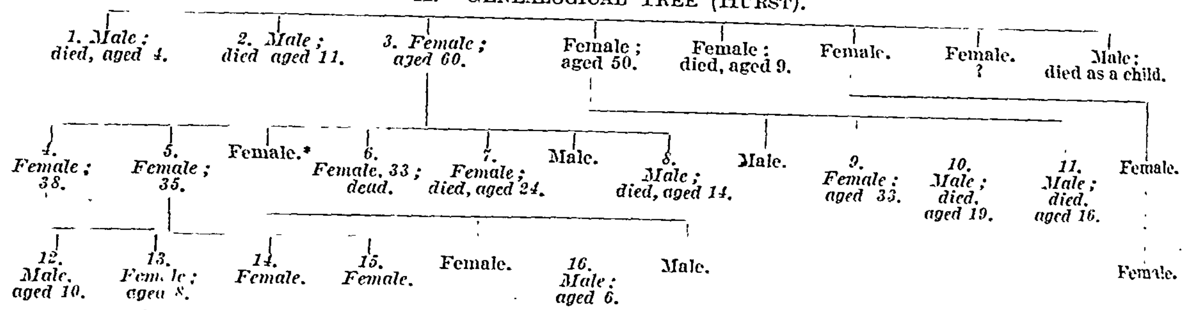
In the matter of raising the general resistance, we are on somewhat firmer ground. There are certain experimental and clinical hints on which we may act. Rats fed on a vitamin-excess diet are very resistant to cancer grafts; let us give our patients a suitable diet. Again, patients whose blood is normal in every respect respond well to X rays. Sunlight increases the red cells and the hæmoglobin index. See that patients have it—natural, if possible; it not, then synthetic. The "open-air cure" is as important in cancer as in tubercle, but the exposure of delicate patients to the outdoor conditions of an English winter is not to be recommended, unless artificial sunlight is supplied when there is none from above.

Closely associated with the question of general resistance is the mental attitude of patients. There can be little doubt but that some of them literally worry themselves into their graves. In this connexion it is interesting to recall the history of tuberculosis of the lungs. Twenty years ago there was almost the same reluctance to tell a patient he was suffering from "consumption", as now to inform him that he has cancer. The public dread of the disease is now much less, and it is possible to deal with most lung patients as rational beings. From a long experience, I cannot help feeling that well-meant attempts to conceal from a patient that he has cancer are often only partially successful. With men, it is, as a rule, scarcely worth while to make the attempt; and it becomes increasingly difficult to conceal the truth from women, while at the same time taking those measures which offer the best scope of recovery. A brutal announcement of "cancer" at the first consultation often does irreparable harm; but the patient can be accustomed gradually to the idea without the word being actually mentioned. Only thus can we secure the full coöperation of the patient, who cannot otherwise understand why she should be medically watched after her "lump" has disappeared. Attempts at such watching and prophylaxis, without full explanation, often lead to suspicion and even resentment. Some of my most cheerful patients are women who are quite aware of what is the matter with them, and upon whom no greater deception has been practised than the representation to them that their individual cases are an especially favourable type of a grave disease. I am, in short, in favour of greater frankness; while quite recognising that there are people, who, if convinced that they had cancer, would forthwith turn their faces to the wall and die.

drinking claret. There is no history of nephritis in the other five members of that generation. The children of Case 3 all seem to have suffered from the same condition as the mother—intermittent attacks of hæmaturia which could be brought on by eating certain substances, usually black currants. The attacks in these members of the family seem to have been more of the nature of a pure hæmaturia than a parenchymatous nephritis. Though they were associated with malaise and some fever, tube casts, other than blood casts, did not appear in the urine; there is no history of œdema or of cardio-vascular disturbance. Case 8 was more severe than the others, and pericarditis, presumed to be of a nephritic origin, was a terminal complication.

Leonard G. Guthrie made a study of this part of the family[4] and describes the condition as "idiopathic or congenital hereditary and family hæmaturia" in the following terms:—That it is: (1) Hereditary—familial and congenital; (2) persistent for many years, but may vary in extent; (3) liable to paroxysmal exacerbations with influenzal-like symptoms; (4) not marked by œdema, ascites, or cardio-vascular disturbance; (5) not due to uric acid or oxalates; (6) not accompanied by urine of low specific gravity (1015–1020). From these facts Guthrie omits the word "nephritis" and favours "hæmaturia" in describing the condition.

A.—GENEALOGICAL TREE (HURST).



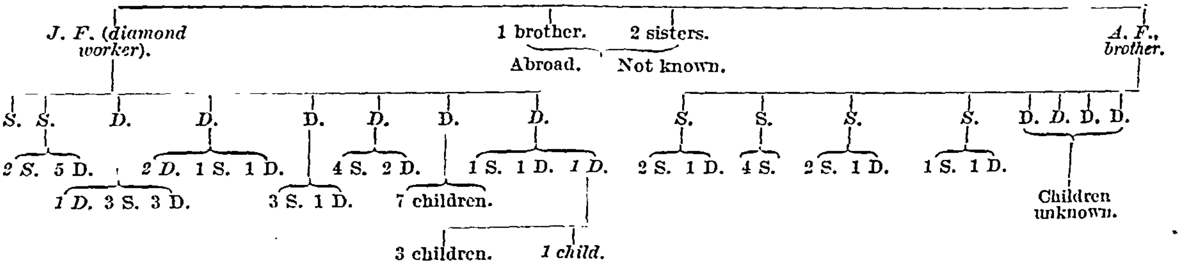
Cases suffering from nephritis are italicised. * Has had attacks of epistaxis and hæmatemesis.

Second Generation.—The second part of the second generation, described by Hurst, consisting of three males and one female, were descended from a mother who had not suffered from any renal derangement, but two of the males and the female member were affected with what appears to be a definite nephritis and very little hæmaturia. The one female (Case 9) is well, but has had albuminuria since 3 weeks of age. Two brothers, however, showed severe symptoms. One (Case 10) was found to have albumin in the urine at the age of 14, after which the albuminuria persisted, together with attacks of hæmaturia after exertion, to terminate in death from uræmia at the age of 19, after an attack of influenza. The other brother (Case 11) was found to suffer from albuminuria when 2 years of age, persisting till his death at the age of 16 years. When he was 12 years old there was no œdema, but the blood pressure measured 143 mm. of mercury. The urine at this time was albuminous, contained numerous blood cells, and granular and hyaline casts. When seen two years later he was pale and anæmic, had had several attacks of sickness, the blood was 137 mm. Hg and the heart considerably hypertrophied. His urine contained, in addition to the albumin, casts of a coarsely granular and fatty-epithelial nature. The specific gravity was 1010. Shortly after this he became uræmic, with anuria, and showed some puffiness of the face. He recovered from this, but died in his sleep shortly after. The symptoms of this part of the family show definite nephritis, mainly of the interstitial type. Œdema and cardio-vascular disturbance are marked features, while the specific gravity of the urine was less than 1015. Guthrie's description—family hæmaturia—given to Cases 3, 6, 7, and 8 is, therefore, not applicable in Cases 9, 10, and 11.

Hurst has made further investigations upon this interesting family, and has been good enough to permit us to give recent data which supplement what he has already published. The new facts concerning this branch of the family are that a daughter of the fifth member of the first generation, a mother free from kidney disease, is herself free and has a daughter in the third generation also entirely free—thus, this branch of the family seems to have escaped the trouble affecting the rest of the family.

Third Generation.—In his communication Hurst mentioned only Case 12 of the third generation, but children have since been born, four of whom are affected with kidney disease. Case 12, a male child of Case 4, a female who is "subject to attacks of hæmaturia," but apparently not of a serious nature. The child, at present 10 years of age, had an attack of hæmaturia in infancy, and later a sore-throat and temperature of 102° F. After this he suffered for six weeks from albuminuria, together with hyaline, epithelial, and granular casts. This condition has cleared up to some extent, but has left an apparently high blood pressure. This child has a sister of 8 years (Case 13), who is affected, but of whom there are no details. Case 5, a female who does not suffer severely, has two female children who are affected (Cases 14 and 15). The third daughter of Case 3, sister of Cases 4, 5, 6, 7, and 8, who suffers from epistaxis and hæmatemesis but not from hæmaturia, has a daughter and two sons, one son being affected—in this case the condition has missed a generation.

B.—GENEALOGICAL TREE (PEL).



Those suffering from nephritis are italicised. S. = son. D. = daughter.

In naming the condition, Hurst has employed the terms "hereditary, familial, congenital, hæmorrhagic nephritis." The condition fulfils all these descriptions. After a broader survey of the family than Guthrie's, Hurst prefers the term "nephritis," as being more accurate than "hæmaturia." Throughout the family the males seem to be affected very much more than the females, all the affected male members having succumbed except the two children of the third generation. The females, on the other hand, seem to be affected only to a slight extent, slight albuminuria, together with hæmaturia in the majority of cases, and then only under certain conditions. It would be interesting to note later if the condition was carried down by the male members as it has been by the females.

A family has been very fully investigated by Pel.[5] Three generations are given fully and a fourth mentioned—in all there are 19 cases of nephritis. The main familial points in the tree are shown in Tree B—fuller detail may be found in the original article.

The cases appear to have been of a chronic interstitial type, and several are stated to have died in uræmia. Throughout this family, the males and females appear to be affected equally. In the third generation the disease seems to be lessening, though one member has a child in a fourth

The father died of apoplexy at the age of 75, the mother died of apoplexy at the age of 68. An uncle, brother of the mother, died of apoplexy at the age of 60. A sister had acute nephritis with terminal apoplexy at the age of 51, and a brother died of chronic Bright's disease at the age of 46. Our patient had nothing abnormal in her general appearance except dilated turgid capillaries about the end of the nose. She was found to be suffering from chronic interstitial nephritis, marked arterio-sclerosis, and hyperpiesia with cardiac hypertrophy. The systolic blood pressure was 230 mm. Hg. On most days there was a trace of albumin in the urine. The specific gravity varied from 1012–1022. Reaction acid. Oxalate crystals, epithelial and red blood cells were present in the urine on admission. The amount of urine was never more than 50 oz. daily and was usually much less. The blood-urea was not increased.

The renal function tests made were as follows:—9 A.M.: 210 c.cm., 0·8 urea, 22 phenol-sulphon-phthalein (P.S.P.); 10 A.M.: 100 c.cm., 1·7 urea, 17 P.S.P. The Wassermann test was negative.

A family, composed of the father and mother, three sons and two daughters, has also recently come under our observation. Three sons and one daughter were found to be suffering from definite symptoms of renal involvement, and were admitted to hospital under our charge. The other daughter was compelled to give up attendance at school before the statutory leaving age, owing to the state of her heart and general health. There is also in this case evidence of a kidney defect.

We endeavoured to elucidate the relative significance of hereditary and acquired ætiological factors in these cases.

Question of Hereditary Factors.

Nephritis in the Antecedents.—An uncle died in the R.I.E. in 1920, from nephritis, but we have been unable to trace the record. An uncle is at present suffering from chronic nephritis. On examination of the father's urine, on one occasion only, no albumin, cells, or tube casts were present. The mother was apparently healthy.

Syphilis.—We examined the family to ascertain whether syphilis might have been a causal factor in the production of arterio-sclerosis. None of the stigmata of syphilis were present in any member of the family, and in the blood of the three sons the Wassermann test gave negative results. The blood of the daughter who presented symptoms of renal involvement was not submitted to the test. The family seems, however, to be free from all syphilitic taint.

Question of Acquired Factors.

The discovery of nephritis in four young members of one family, more or less about the same time, suggests some common acquired causal factor. It is improbable that each of the cases had a different cause. The facts relative to these matters are given in the records of the individual cases.

Although these cases of nephritis were diagnosed within a few weeks of each other, we are quite unable to say, even approximately, the dates of origin. The symptoms observed were, in fact, interpreted as exacerbations of previously existing kidney disorder, but showing no manifestations of the condition, as no previous history was obtained in any of the four patients studied.

Surroundings at Home and at Work.

The family lives in a house consisting of a room, kitchen, scullery, and lavatory. Living in this are nine persons: Father and mother, three sons (aged 20, 19, and 18), two daughters (aged 14 and 10), two lodgers (men). The house is situated in a street. The water-supply is derived from a distant reservoir and is laid on to all the houses separately in pipes (not a common pipe outside). Food is supplied by local tradesmen, and in no way differs from that supplied to other inhabitants of the street. All the male members of the family are coalminers. Work at the mine is in two shafts, the west and the south. The former contains a foot deep of water, but the temperature is moderate. The latter is dry but extremely hot, causing those working in it to become soaked in perspiration. The work of the boys is that of "drawer," and consists in hauling "hutches" back from the coal face. At the end of the trip in the south working they have to wait and are apt to get chilled after the heat. This south shaft has a bad reputation amongst miners, but on account of the heat they have to work in and not on account of any illness, other than chill, contracted while working there. Food and a bottle of water are carried by the workers. No water is obtainable at the pit for drinking, and tea cannot be made there. Symptoms pointing to renal disorder, such as are complained of by the boys, are evidently uncommon, and have not been noticed by them, or their mother, either at the mine or in the district.

Records of the Cases.

David S., aged 18, coalminer. Was admitted on May 16th, 1922, complaining of swelling of the face and pain in the head. The history was that five days before admission he caught a chill, playing football. It was learned, on further inquiry, that there had been some swelling of the face two months before the onset of the illness for which he was admitted. In infancy he had measles, and during childhood the tonsils were removed. He does not appear to have had any other illnesses. On examination his face was swollen and puffy, but not very œdematous. His complexion was pasty. He had no marked anæmia. Examination of the urinary system showed the presence of albumin, blood, and casts—albumin about 10 g. per litre. The casts were chiefly composed of broken-down epithelium and blood cells. Streptococci were isolated from the urine on three occasions. (No subjective symptoms were complained of.) The non-protein nitrogen of the blood was 42 mg. per 100 c.cm. The urea concentration in the second hour was 1·7 per cent. The P.S.P. excretion was high—95 per cent. being returned in two hours.

Renal efficiency tests, June 28th, 1922:—First hour: 270 c.cm., 1·1 per cent. urea, 60 per cent. P.S.P.; second hour: 113 c.cm., 1·7 per cent. urea, 35 per cent. P.S.P.

The heart was somewhat enlarged, the apex being 4¼ inches from the middle line. Diffuse pulsation was seen in the fourth and fifth intercostal spaces, and the movement was heaving in character. The heart sounds were closed. The radial artery was definitely palpable, and the systolic blood pressure (taken on May 21st) was 172 mm. Hg. Blood culture yielded a growth of streptococci on one occasion. Ten teeth were present in each jaw. These were carious and in a septic condition. The breath was rather foul. There was no congestion of the fauces. A mixed growth of organisms was obtained from the teeth and tonsillar region, with streptococci preponderating. The Wassermann reaction was negative.

The patient was first put on a salt-free diet, and later on light diet. Daily hot-air baths were given. The further course was that the œdema gradually disappeared; the albuminuria was somewhat obstinate, ranging during the first eight days from 6 to 15 g. per litre, dropping gradually to 1 g. per litre, and remaining at this. Hæmaturia occurred on ten occasions, and ceased shortly before his discharge from hospital in the early part of August. Blood, epithelial cells, and granular casts were noted once. When we saw him again by request, four months after his discharge from hospital (seven months after admission), a mere opalescence appeared on heating the urine, and streptococci were obtained in cultures. The S.B.P. was 126, and the apex beat of the heart was 3½ inches from the mid-line. He had been at work since his discharge and had felt entirely well.

John S., aged 20, coalminer, was admitted to hospital on June 6th, 1922. Complaint: Swelling of face; pain in back; headache, which had been present four days. He had worked in both the wet and the hot shafts—in the latter he worked stripped to the waist, and he had only worked nine days there when he was taken ill. He consulted his doctor, who sent him to hospital. The only previous illness of any importance was osteomyelitis ten years previously, when part of the right tibia was removed. He had not required medical attendance in recent years. He had not had scarlet fever. There was no history of previous attacks of nephritis. On examination, his face was puffy around the eyes but not very œdematous.

Examination of the urinary system: No subjective symptoms were complained of. The urine was passed in good quantities (1136–1845 c.cm. per diem). Traces of blood were present, and albumin to the extent of 4 g. per litre. Granular and hyaline casts were present, but no organisms, pus, or epithelial cells were found in a stained film. No growth was obtained on culture. The non-protein nitrogen of the blood was 36 mg. per 100 c.cm. The urea concentration in the second hour was 2·3 per cent.

The P.S.P. excretion was not good, 50 per cent. being returned in two hours. First hour: 183 c.cm., 1·4 per cent. urea, 35 per cent. P.S.P.: second hour: 106 c.cm., 2·3 per cent. urea, 15 per cent. P.S.P. A blood count showed some leucocytosis.

The apex of the heart was 3¾ in. from the mid-line. There was a slight systolic murmur at the mitral area, but no accentuation of the second sound. No subjective symptoms were complained of. The wall of the radial artery was definitely palpable. The arterial wave was slow in upstroke and downstroke and well sustained, the vessel was not easily compressed. The systolic blood pressure was 148 mg. Hg. No growth was obtained from blood cultures on two occasions. The fundus oculi showed no changes. Six teeth were in bad condition, but there was no pyorrhœa alveolaris. The tongue was slightly furred: the fauces healthy. The Wassermann reaction was negative.

The patient responded to treatment more quickly than in the last case, the blood disappearing from the urine and the albumin diminishing to a trace. Four months after leaving hospital the urine was completely free of albumin, the S.B.P. was 142 mm. Hg (the arteries were very definitely palpable), œdema was absent, and no subjective symptoms were complained of. Stained films of the urine were bacteriologically negative.

Joseph S., aged 19, coalminer, was admitted to hospital on June 26th, 1922, as we wished to examine as many members of the family as were willing to present themselves. He had been unemployed for a fortnight previous to admission, but had felt fit and well. Before this he had worked in both shafts. Complaint: Swelling of the face, commencing one week before admission, but of no other symptoms. On examination, patient showed some puffiness under the eyes, but he did not feel ill in any way. The swelling had been present for one week. He could remember no illness, even during childhood. Examination of the urinary system showed slight frequency of micturition—he had to rise once during the night. The quantity per diem was 994–1278 c.cm. The urine itself showed a trace of blood, and albumin to the extent of 1 to 3 g. per litre. Hyaline casts, red blood corpuscles, and epithelial cells were found in the deposit. Cultural examination was negative.

On July 10th the non-protein nitrogen of the blood was 38 mg. per 100 c.cm. Urea concentration in the second hour was 2·6 per cent. P.S.P. elimination good, at 80 per cent. in two hours. First hour: 73 c.cm., 2·3 per cent. urea, 45 per cent. P.S.P.; second hour: 82 c.cm., 2·6 per cent. urea, 35 per cent. P.S.P.

Examination of the circulatory system revealed no subjective symptoms. The heart was somewhat enlarged, the apex being 4¼ in. from the mid-line—it was forcible in character, though not increased in extent. The wall of the radial artery was definitely palpable. Systolic blood pressure was 172 mm. Hg. No growth was obtained from blood cultures. Teeth were in fair condition and gums healthy. Tonsils not enlarged. Wassermann reaction of the blood negative. In cultures from teeth and tonsils streptococcal colonies were numerous.

Patient responded well to treatment, and showed a decrease of blood pressure to 143 mm. Hg and the albumin and blood in the urine diminished to a trace. A few well-formed granular casts were present on one occasion. On examination four months after leaving hospital there was only a faint trace of albumin in the urine, the heart had diminished in size, the apex being 3¼ in. from the mid-line, the first sound was dull and the second slightly accentuated, the S.B.P. was 139, and the arterial wall palpable.

Alice S., aged 10. It was heard that this girl was suffering from some urinary trouble, and she was sent for and admitted to hospital. It appeared that six months previously she had some pain in the right iliac fossa, and she was then seen in the Royal Hospital for Sick Children. There she was X rayed and told there was "something growing round the kidney." She had had measles. On admission, there was no anæmia, and the patient appeared to be in health.

Examination of the urinary system: There were no subjective symptoms nor any increase in micturition. Traces of albumin were present in the urine for two days after admission. Otherwise, no abnormal constituents were found. No organisms, pus cells, or epithelial cells were found in films made from the urine. From cultures a streptococcus was obtained on one occasion. The apex of the heart was 2½ in. from the mid-line and the sounds were closed. The radial artery wall was not thickened, but the pulse wave was somewhat difficult to compress. A growth of streptococci was obtained from the blood. After rest for a few days, on light diet, the urine became completely free from albumin.

The patients were visited in January, 1924. All three boys were found to be perfectly fit and working constantly as coalminers. The urine in all cases was free from albumin, blood, and casts. The daughter, Alice, was well. Her urine, also, contained no abnormal constituents. A specimen of urine from the daugher (Ellen), who was not previously examined, was obtained. This was found to contain a trace of albumin, due to a bacteriuria presumably from a pyelitis. The urine of the father was again examined and found to be free from albumin.

BACTERIOLOGICAL INVESTIGATION.

The bacteriological investigation originated in the course of the ordinary routine examination of catheter specimens sent from these cases. The initial findings of streptococci in the blood and urine of two of them suggested not only the desirability of confirming these results, but also of extending the bacteriological examination. The further observations were made in order to determine the identity and possible relationship of the streptococci isolated from the various sources, so that an opinion might be formed regarding a possible primary focus of infection.

The following method was adopted in classifying the streptococci. The hæmolytic test, used in dividing such organisms generally into two main groups, was initially applied. This was followed by division into sub-groups by Holman's method of classification,[12] in which lactose, mannite, and salicin are used in Hiss's serum-water with litmus as indicator. In regard to the use of fermentation tests in the classification of streptococci, the opinion seems to be that they lead to an unjustified multiplicity of sub-groups, which do not show any marked difference in their relation to disease processes. Like most fermentative tests, those advocated by Holman are not wholly reliable, and as tests, even in determining sub-groups, they have been found to be inadequate. Although the polysaccharide inulin is mentioned by Holman it is not included in his classification, having been mainly used by him in differentiating the pneumococcus from the streptococcus. This sugar was used for this purpose also in the present work, but in addition it was noted that the results obtained with the several strains studied served to indicate the inadequacy of Holman's classification in one direction at least. Such findings will be discussed later, but it may be mentioned that they confirm the conclusion arrived at by Logan[13] in regard to the sugar tests advocated by Holman being insufficient, and more adapted as a preliminary guide to serological tests, such as have been applied by several workers. By such means, Douglas, Fleming, and Colebrook[14] found that 24 strains of *S. pyogenes* were identical, although the sugar reactions differed. Similar observations have been recorded by Gordon.[15] This pertains to one member of the hæmolytic group, but it is possible that some members of the non-hæmolytic group, with which we are dealing in the present work, may also vary biochemically, yet be identical serologically.

Technique.

The following observations are based on the bacteriological examination of the blood, urine, and teeth in all four cases, and, in addition, the tonsils and tonsillar region in three of the cases. Blood cultures were prepared by inoculating at least 2 c.cm. of the patient's blood into flasks containing 50 c.cm. of broth. These were examined daily, and sub-cultures were made on each succeeding day up to the seventh before pronouncing them negative. From catheter specimens of urine the centrifugalised deposit was inoculated into aerobic and anaerobic media. Preparatory to inoculating tubes from the teeth and tonsils the patients were asked to cleanse the teeth and mouth, after which the tonsils and pockets in decayed teeth were swabbed. It may be noted that in all cases the teeth showed caries in the incisors and molars to a greater or less degree. With the exception of Case 4, which failed to appear at a later date, the bacteriological examination was carried out on two occasions, an interval of four months having intervened.

Results of First Examination.

A feature of the original blood cultures from Cases 1 and 4 was, that growth did not appear until the fifth and sixth day respectively. Pure growths of streptococci were obtained the following day in subculture. Similarly with the urine, delayed growth appeared on the third day of incubation and only in aerobic media. In all cases the cultures from the teeth yielded a mixed growth with streptococcal colonies in the majority. Several different-sized colonies were isolated in each case in view of the possibility of a mixed streptococcal

—	Blood.	Urine.	Teeth.
Case 1: David S.	Streptococcus.	Streptococcus.	Mixed growth with streptococcal colonies in majority.
Case 2: John S.	No growth.	No growth.	
Case 3: Joseph S.	,,	,,	
Case 4: Alice S.	Streptococcus.	Streptococcus.	

The father died of apoplexy at the age of 75, the mother died of apoplexy at the age of 68. An uncle, brother of the mother, died of apoplexy at the age of 60. A sister had acute nephritis with terminal apoplexy at the age of 51, and a brother died of chronic Bright's disease at the age of 46. Our patient had nothing abnormal in her general appearance except dilated turgid capillaries about the end of the nose. She was found to be suffering from chronic interstitial nephritis, marked arterio-sclerosis, and hyperpiesia with cardiac hypertrophy. The systolic blood pressure was 230 mm. Hg. On most days there was a trace of albumin in the urine. The specific gravity varied from 1012–1022. Reaction acid. Oxalate crystals, epithelial and red blood cells were present in the urine on admission. The amount of urine was never more than 50 oz. daily and was usually much less. The blood-urea was not increased.

The renal function tests made were as follows:—9 A.M.: 210 c.cm., 0·8 urea, 22 phenol-sulphon-phthalein (P.S.P.): 10 A.M.: 100 c.cm., 1·7 urea, 17 P.S.P. The Wassermann test was negative.

A family, composed of the father and mother, three sons and two daughters, has also recently come under our observation. Three sons and one daughter were found to be suffering from definite symptoms of renal involvement, and were admitted to hospital under our charge. The other daughter was compelled to give up attendance at school before the statutory leaving age, owing to the state of her heart and general health. There is also in this case evidence of a kidney defect.

We endeavoured to elucidate the relative significance of hereditary and acquired ætiological factors in these cases.

Question of Hereditary Factors.

Nephritis in the Antecedents.—An uncle died in the R.I.E. in 1920, from nephritis, but we have been unable to trace the record. An uncle is at present suffering from chronic nephritis. On examination of the father's urine, on one occasion only, no albumin, cells, or tube casts were present. The mother was apparently healthy.

Syphilis.—We examined the family to ascertain whether syphilis might have been a causal factor in the production of arterio-sclerosis. None of the stigmata of syphilis were present in any member of the family, and in the blood of the three sons the Wassermann test gave negative results. The blood of the daughter who presented symptoms of renal involvement was not submitted to the test. The family seems, however, to be free from all syphilitic taint.

Question of Acquired Factors.

The discovery of nephritis in four young members of one family, more or less about the same time, suggests some common acquired causal factor. It is improbable that each of the cases had a different cause. The facts relative to these matters are given in the records of the individual cases.

Although these cases of nephritis were diagnosed within a few weeks of each other, we are quite unable to say, even approximately, the dates of origin. The symptoms observed were, in fact, interpreted as exacerbations of previously existing kidney disorder, but showing no manifestations of the condition, as no previous history was obtained in any of the four patients studied.

Surroundings at Home and at Work.

The family lives in a house consisting of a room, kitchen, scullery, and lavatory. Living in this are nine persons: Father and mother, three sons (aged 20, 19, and 18), two daughters (aged 14 and 10), two lodgers (men). The house is situated in a street. The water-supply is derived from a distant reservoir and is laid on to all the houses separately in pipes (not a common pipe outside). Food is supplied by local tradesmen, and in no way differs from that supplied to other inhabitants of the street. All the male members of the family are coalminers. Work at the mine is in two shafts, the west and the south. The former contains a foot deep of water, but the temperature is moderate. The latter is dry but extremely hot, causing those working in it to become soaked in perspiration. The work of the boys is that of "drawer," and consists in hauling "hutches" back from the coal face. At the end of the trip in the south working they have to wait and are apt to get chilled after the heat. This south shaft has a bad reputation amongst miners, but on account of the heat they have to work in and not on account of any illness, other than chill, contracted while working there. Food and a bottle of water are carried by the workers. No water is obtainable at the pit for drinking, and tea cannot be made there. Symptoms pointing to renal disorder, such as are complained of by the boys, are evidently uncommon, and have not been noticed by them, or their mother, either at the mine or in the district.

Records of the Cases.

David S., aged 18, coalminer. Was admitted on May 16th, 1922, complaining of swelling of the face and pain in the head. The history was that five days before admission he caught a chill, playing football. It was learned, on further inquiry, that there had been some swelling of the face two months before the onset of the illness for which he was admitted. In infancy he had measles, and during childhood the tonsils were removed. He does not appear to have had any other illnesses. On examination his face was swollen and puffy, but not very œdematous. His complexion was pasty. He had no marked anæmia. Examination of the urinary system showed the presence of albumin, blood, and casts—albumin about 10 g. per litre. The casts were chiefly composed of broken-down epithelium and blood cells. Streptococci were isolated from the urine on three occasions. (No subjective symptoms were complained of.) The non-protein nitrogen of the blood was 42 mg. per 100 c.cm. The urea concentration in the second hour was 1·7 per cent. The P.S.P. excretion was high—95 per cent. being returned in two hours.

Renal efficiency tests, June 28th, 1922:—First hour: 270 c.cm., 1·1 per cent. urea, 60 per cent. P.S.P.; second hour: 113 c.cm., 1·7 per cent. urea, 35 per cent. P.S.P.

The heart was somewhat enlarged, the apex being 4¼ inches from the middle line. Diffuse pulsation was seen in the fourth and fifth intercostal spaces, and the movement was heaving in character. The heart sounds were closed. The radial artery was definitely palpable, and the systolic blood pressure (taken on May 21st) was 172 mm. Hg. Blood culture yielded a growth of streptococci on one occasion. Ten teeth were present in each jaw. These were carious and in a septic condition. The breath was rather foul. There was no congestion of the fauces. A mixed growth of organisms was obtained from the teeth and tonsillar region, with streptococci preponderating. The Wassermann reaction was negative.

The patient was first put on a salt-free diet, and later on light diet. Daily hot-air baths were given. The further course was that the œdema gradually disappeared; the albuminuria was somewhat obstinate, ranging during the first eight days from 6 to 15 g. per litre, dropping gradually to 1 g. per litre, and remaining at this. Hæmaturia occurred on ten occasions, and ceased shortly before his discharge from hospital in the early part of August. Blood, epithelial cells, and granular casts were noted once. When we saw him again by request, four months after his discharge from hospital (seven months after admission), a mere opalescence appeared on heating the urine, and streptococci were obtained in cultures. The S.B.P. was 126, and the apex beat of the heart was 3½ inches from the mid-line. He had been at work since his discharge and had felt entirely well.

John S., aged 20, coalminer, was admitted to hospital on June 6th, 1922. Complaint: Swelling of face; pain in back; headache, which had been present four days. He had worked in both the wet and the hot shafts—in the latter he worked stripped to the waist, and he had only worked nine days there when he was taken ill. He consulted his doctor, who sent him to hospital. The only previous illness of any importance was osteomyelitis ten years previously, when part of the right tibia was removed. He had not required medical attendance in recent years. He had not had scarlet fever. There was no history of previous attacks of nephritis. On examination, his face was puffy around the eyes but not very œdematous.

Examination of the urinary system: No subjective symptoms were complained of. The urine was passed in good quantities (1136–1845 c.cm. per diem). Traces of blood were present, and albumin to the extent of 4 g. per litre. Granular and hyaline casts were present, but no organisms, pus, or epithelial cells were found in a stained film. No growth was obtained on culture. The non-protein nitrogen of the blood was 36 mg. per 100 c.cm. The urea concentration in the second hour was 2·3 per cent.

The P.S.P. excretion was not good, 50 per cent. being returned in two hours. First hour: 183 c.cm., 1·4 per cent. urea, 35 per cent. P.S.P.: second hour: 106 c.cm., 2·3 per cent. urea, 15 per cent. P.S.P. A blood count showed some leucocytosis.

The apex of the heart was 3¾ in. from the mid-line. There was a slight systolic murmur at the mitral area, but no accentuation of the second sound. No subjective symptoms were complained of. The wall of the radial artery was definitely palpable. The arterial wave was slow in upstroke and downstroke and well sustained, the vessel was not easily compressed. The systolic blood pressure was 148 mg. Hg. No growth was obtained from blood cultures on two occasions. The fundus oculi showed no changes. Six teeth were in bad condition, but there was no pyorrhœa alveolaris. The tongue was slightly furred: the fauces healthy. The Wassermann reaction was negative.

The patient responded to treatment more quickly than in the last case, the blood disappearing from the urine and the albumin diminishing to a trace. Four months after leaving hospital the urine was completely free of albumin, the S.B.P. was 142 mm. Hg (the arteries were very definitely palpable), œdema was absent, and no subjective symptoms were complained of. Stained films of the urine were bacteriologically negative.

Joseph S., aged 19, coalminer, was admitted to hospital on June 26th, 1922, as we wished to examine as many members of the family as were willing to present themselves. He had been unemployed for a fortnight previous to admission, but had felt fit and well. Before this he had worked in both shafts. Complaint: Swelling of the face, commencing one week before admission, but of no other symptoms. On examination, patient showed some puffiness under the eyes, but he did not feel ill in any way. The swelling had been present for one week. He could remember no illness, even during childhood. Examination of the urinary system showed slight frequency of micturition—he had to rise once during the night. The quantity per diem was 994–1278 c.cm. The urine itself showed a trace of blood, and albumin to the extent of 1 to 3 g. per litre. Hyaline casts, red blood corpuscles, and epithelial cells were found in the deposit. Cultural examination was negative.

On July 10th the non-protein nitrogen of the blood was 38 mg. per 100 c.cm. Urea concentration in the second hour was 2·6 per cent. P.S.P. elimination good, at 80 per cent. in two hours. First hour: 73 c.cm., 2·3 per cent. urea, .45 per cent. P.S.P.; second hour: 82 c.cm., 2·6 per cent. urea, 35 per cent. P.S.P.

Examination of the circulatory system revealed no subjective symptoms. The heart was somewhat enlarged, the apex being 4¼ in. from the mid-line—it was forcible in character, though not increased in extent. The wall of the radial artery was definitely palpable. Systolic blood pressure was 172 mm. Hg. No growth was obtained from blood cultures. Teeth were in fair condition and gums healthy. Tonsils not enlarged. Wassermann reaction of the blood negative. In cultures from teeth and tonsils streptococcal colonies were numerous.

Patient responded well to treatment, and showed a decrease of blood pressure to 143 mm. Hg and the albumin and blood in the urine diminished to a trace. A few well-formed granular casts were present on one occasion. On examination four months after leaving hospital there was only a faint trace of albumin in the urine, the heart had diminished in size, the apex being 3½ in. from the mid-line, the first sound was dull and the second slightly accentuated, the S.B.P. was 139, and the arterial wall palpable.

Alice S., aged 10. It was heard that this girl was suffering from some urinary trouble, and she was sent for and admitted to hospital. It appeared that six months previously she had some pain in the right iliac fossa, and she was then seen in the Royal Hospital for Sick Children. There she was X rayed and told there was "something growing round the kidney." She had had measles. On admission, there was no anæmia, and the patient appeared to be in health.

Examination of the urinary system: There were no subjective symptoms nor any increase in micturition. Traces of albumin were present in the urine for two days after admission. Otherwise, no abnormal constituents were found. No organisms, pus cells, or epithelial cells were found in films made from the urine. From cultures a streptococcus was obtained on one occasion. The apex of the heart was 2½ in. from the mid-line and the sounds were closed. The radial artery wall was not thickened. but the pulse wave was somewhat difficult to compress. A growth of streptococci was obtained from the blood. After rest for a few days, on light diet, the urine became completely free from albumin.

The patients were visited in January, 1924. All three boys were found to be perfectly fit and working constantly as coalminers. The urine in all cases was free from albumin, blood, and casts. The daughter, Alice, was well. Her urine, also, contained no abnormal constituents. A specimen of urine from the daugher (Ellen), who was not previously examined, was obtained. This was found to contain a trace of albumin, due to a bacteriuria presumably from a pyelitis. The urine of the father was again examined and found to be free from albumin.

BACTERIOLOGICAL INVESTIGATION.

The bacteriological investigation originated in the course of the ordinary routine examination of catheter specimens sent from these cases. The initial findings of streptococci in the blood and urine of two of them suggested not only the desirability of confirming these results, but also of extending the bacteriological examination. The further observations were made in order to determine the identity and possible relationship of the streptococci isolated from the various sources, so that an opinion might be formed regarding a possible primary focus of infection.

The following method was adopted in classifying the streptococci. The hæmolytic test, used in dividing such organisms generally into two main groups, was initially applied. This was followed by division into sub-groups by Holman's method of classification,[12] in which lactose, mannite, and salicin are used in Hiss's serum-water with litmus as indicator. In regard to the use of fermentation tests in the classification of streptococci, the opinion seems to be that they lead to an unjustified multiplicity of sub-groups, which do not show any marked difference in their relation to disease processes. Like most fermentative tests, those advocated by Holman are not wholly reliable, and as tests, even in determining sub-groups, they have been found to be inadequate. Although the polysaccharide inulin is mentioned by Holman it is not included in his classification, having been mainly used by him in differentiating the pneumococcus from the streptococcus. This sugar was used for this purpose also in the present work, but in addition it was noted that the results obtained with the several strains studied served to indicate the inadequacy of Holman's classification in one direction at least. Such findings will be discussed later, but it may be mentioned that they confirm the conclusion arrived at by Logan[13] in regard to the sugar tests advocated by Holman being insufficient, and more adapted as a preliminary guide to serological tests, such as have been applied by several workers. By such means, Douglas, Fleming, and Colebrook[14] found that 24 strains of *S. pyogenes* were identical, although the sugar reactions differed. Similar observations have been recorded by Gordon.[15] This pertains to one member of the hæmolytic group, but it is possible that some members of the non-hæmolytic group, with which we are dealing in the present work, may also vary biochemically, yet be identical serologically.

Technique.

The following observations are based on the bacteriological examination of the blood, urine, and teeth in all four cases, and, in addition, the tonsils and tonsillar region in three of the cases. Blood cultures were prepared by inoculating at least 2 c.cm. of the patient's blood into flasks containing 50 c.cm. of broth. These were examined daily, and sub-cultures were made on each succeeding day up to the seventh before pronouncing them negative. From catheter specimens of urine the centrifugalised deposit was inoculated into aerobic and anaerobic media. Preparatory to inoculating tubes from the teeth and tonsils the patients were asked to cleanse the teeth and mouth, after which the tonsils and pockets in decayed teeth were swabbed. It may be noted that in all cases the teeth showed caries in the incisors and molars to a greater or less degree. With the exception of Case 4, which failed to appear at a later date, the bacteriological examination was carried out on two occasions, an interval of four months having intervened.

Results of First Examination.

A feature of the original blood cultures from Cases 1 and 4 was, that growth did not appear until the fifth and sixth day respectively. Pure growths of streptococci were obtained the following day in subculture. Similarly with the urine, delayed growth appeared on the third day of incubation and only in aerobic media. In all cases the cultures from the teeth yielded a mixed growth with streptococcal colonies in the majority. Several different-sized colonies were isolated in each case in view of the possibility of a mixed streptococcal

—	Blood.	Urine.	Teeth.
Case 1: David S.	Streptococcus.	Streptococcus.	Mixed growth with streptococcal colonies in majority.
Case 2: John S.	No growth.	No growth.	
Case 3: Joseph S.	,,	,,	
Case 4: Alice S.	Streptococcus.	Streptococcus.	

infection of hæmolytic and non-hæmolytic types. In applying the hæmolytic test, however, all the organisms proved to be of the non-hæmolytic variety.

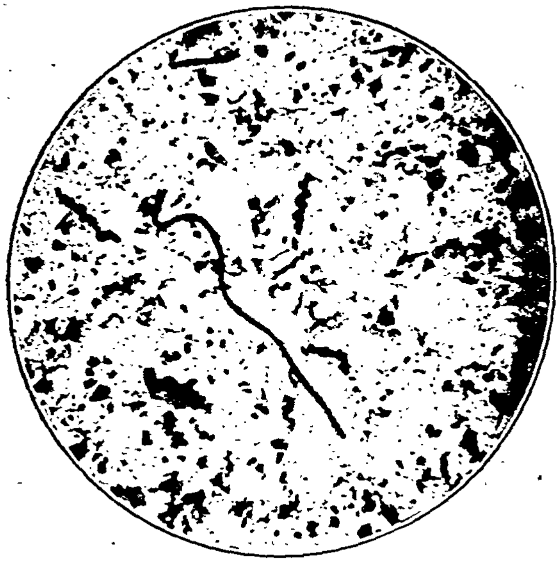
Results of Second Examination.

In regard to the second series only three cases were examined, the tonsils and tonsillar region being included. The original blood cultures in broth, and the succeeding sub-cultures made each day up to the seventh, remained negative and sterile. The urine in Case 1 again gave a pure though scanty growth of streptococci on the third day of incubation, the others remaining negative and sterile. The cultures from the tonsils in each case produced a mixed growth with streptococcal colonies in the majority. Individual colonies were tested as with those from the teeth, and were found to be of the non-hæmolytic type. The appearance of the growth in all the strains isolated was practically identical. All behaved similarly in producing an obvious greenish colouration by the hæmolytic test, and none showed definite hæmolysis; they were thus identified as of the non-hæmolytic, or viridans group, of which most members are regarded as saprophytic. They were differentiated from the pneumococcus by the bile-solubility test, by which means all were proved to be insoluble. Morphologically, they varied only in minor details, all of them showing a tendency to diplococcal formation in short chains.

—	Blood.	Urine.	Teeth.
Case 1 : David S.	No growth.	Streptococcus.	Mixed growth with streptococcal colonies in majority.
Case 2 : John S.	,,	No growth.	
Case 3 : Joseph S.	,,	,,	

The sub-groups were classified according to Holman's method already described. The purity of each strain was previously determined by microscopic examination before inoculations of the sugars were made. The readings were noted daily for one week, and in most instances were based on the results of at least two separate series of sugar tests with each of the organisms. More recent results, which showed departure from the original reactions, are also included for reasons to be discussed later.

FIG. 1.



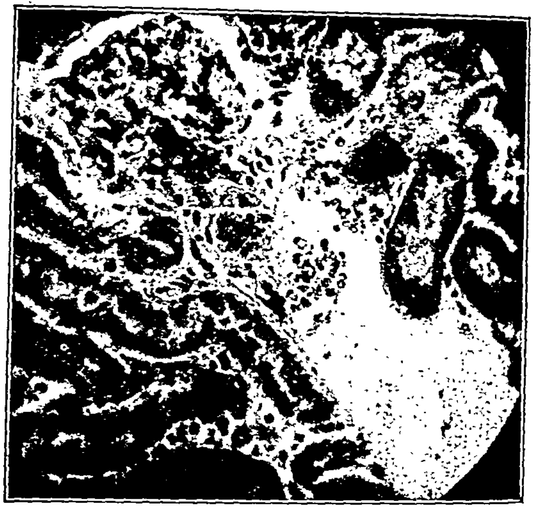
To show numerous tube casts in urine of rabbit which died of acute nephritis.

The streptococci isolated belong to the saprophytic group. The two types *S. mitis* and *salivarius* commonly live as harmless saprophytes in the mouth and throat, but may become pathogenic in certain circumstances. Their immediate interest here lies not only in their prevalence in the teeth and tonsils, but also in the possible relationship of the streptococci in these situations to their occurrence in the blood and urine of two of the cases.

These sub-groups of non-hæmolytic streptococci have been classified by their sugar reactions meantime, the reliability of which is much in question at the present time. The importance of such a division is considered more academic than real,[16] and of no great consequence from the point of view of their relation to disease.

The differentiation between *S. mitis* and *salivarius* depends on their behaviour towards salicin, in which sugar it has not been constant. One strain conformed to *S. mitis* and another to *S. salivarius* on the first two occasions. In tests repeated several times subsequently and on recent dates they interchanged their identity, judging entirely from their reactions in salicin. That the sugar was not inert, or the organisms dead, were verified by the reactions of the other strains in the same batch of salicin, by microscopic examination and by sub-culture. Their reaction in inulin was also noted in which two strains of *S. mitis* and one of *S. salivarius* gave a positive reaction. On this latter feature, other characters being absent, Holman considers such organisms as inulin-fermenting varieties of their respective types. A similar inference suggests itself in the present case to account for the irregular reactions in salicin, in that one might be merely a variant of the other; and as with some specimens of *S. pyogenes* which differed in their behaviour towards mannite, yet were found to be serologically identical, so it may conceivably be in the present instance with *S. mitis* and *salivarius* that, though differing biochemically, they may be the same serologically.

FIG. 2.



Section of rabbit's kidney, showing œdema, hæmorrhage, and acute tubular changes. Animal died in five days.

The results of the investigation generally, apart from the question of academic points, present features of a suggestive nature. These features become more interesting, however, if the one organism may be considered a variant of the other. Whether this be so or not has not yet been determined, but it will suffice for the present purpose to note that they are of the non-hæmolytic group, and to consider their characters in this respect. Such streptococci closely associate themselves with chronic streptococcal infections, possess high power of invasion, and tissues in a state of low resistance are attacked by them. They stimulate little reaction on the part of the body, and apparently render the tissues more susceptible to reinfection with a fatal issue only after a prolonged course or repeated reinfections. They give rise to tonsillitis of a relatively mild form. Both *S. mitis* and *salivarius* have occasionally been found in pathological conditions in the blood and in endocarditis. In addition to other toxic agencies it is stated by MacCallum that streptococcal infections, especially protracted subacute infections with *S. viridans*, to which group the above organisms belong, may cause a glomerulo-nephritis with consequent destruction of the whole glomerular structure.

It is significant that the streptococci found in the blood and urine are not only closely allied, but may possibly be biologically identical with those isolated from the teeth and tonsils, and that they are of the group associated with subacute infections, into which category the four cases may be classed.

EXPERIMENTAL OBSERVATIONS. BY DR. BUCHANAN.

The association of non-hæmolytic streptococci with certain of the cases of subacute nephritis recorded above, suggested to one of us (G. B.) a general investigation into the rôle played by such streptococci in the production of experimental nephritis in rabbits. This work is at present in progress. It is the intention of this communication merely to indicate the nature of the experiments and such results as bear upon the problem of the causation of nephritis. The investigation when completed will form the subject of an independent paper.

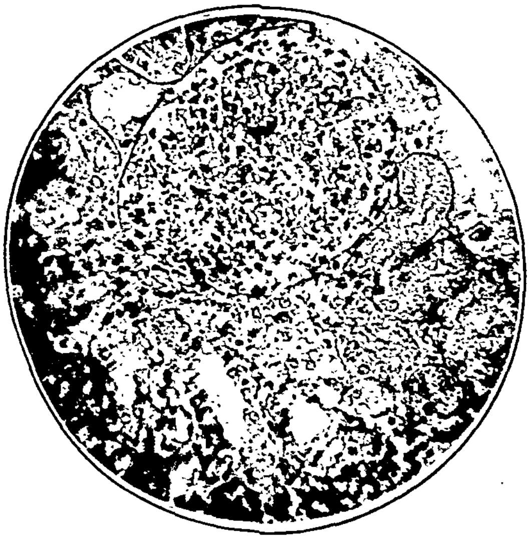
The strains of streptococci isolated from the earlier cases studied by us unfortunately died out before a licence for animal experiments was granted. Other cases of subacute nephritis were, however, investigated later, and from two of them a pure growth of a non-hæmolytic streptococcus was obtained from catheter specimens of urine. The two organisms conformed biochemically to *S. fæcalis*. These were used for experimental purposes.

The animals selected for this work were kept under observation for one week before beginning the experiments. Only those whose urine was entirely free from albumin and other evidence of renal trouble were used.

The nature of the experiments consisted in a study of the effects produced on the function and structure of the kidney by the following agencies: (1) Cold and damp; (2) cold and damp, plus streptococcal blood infection: (3) streptococcal blood infection.

The method used in determining the effects of cold and damp was that adopted by Cicconardi,[17] in which a freezing mixture is applied to the dorsum in the region of the kidneys. The object in the present work was to ascertain if the influence of local chilling, as a predisposing factor, rendered the kidney more susceptible to injury by the action of the circulating streptococci. The repeated daily chilling, applied for one hour, constantly lowered the rectal temperature 2° C., but urinary examination revealed no abnormal constituents. No very marked alteration in kidney structure was noted in chilled animals chloroformed at varying intervals. The introduction of repeated doses of streptococci into the circulation after chilling has so far not given uniform results. It was thought at first that the chilling induced a more rapidly fatal issue, but later it was found that the injection of streptococci alone was as rapidly fatal in some instances, and produced almost similar kidney lesions.

FIG. 3.

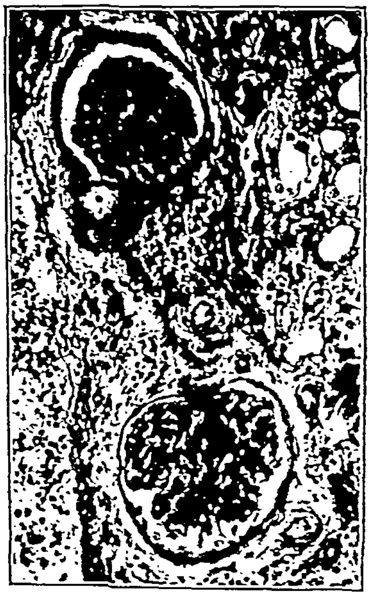


Section of rabbit's kidney showing acute glomerulo-nephritis and tubular degeneration. Animal died in seven days.

It will meet the present purpose to state briefly that as a result of the intravenous injection of the non-hæmolytic streptococcus, *S. fæcalis*, into rabbits symptoms of acute nephritis were produced. Albumin in considerable quantity appeared in the urine within the first week after inoculation. In some cases it increased daily in amount, and persisted until the animals died. In other instances where the animal survived for a longer period the albumin decreased and almost disappeared. Microscopically (Fig. 1) the urines of these animals invariably showed abundant tube casts, chiefly hyaline in nature, although granular, epithelial, and blood forms were also present. Red cells and epithelial cells were very numerous.

In some animals which succumbed shortly after inoculation the post-mortem examination showed an accumulation of fluid in the pericardial sac and abdominal cavity. This appeared to be a result of the nephritis; no evidence of pericarditis or peritonitis was observed. In such cases the kidney presented the typical microscopical changes associated with acute diffuse nephritis. Particularly marked was the degree and extent of the œdema, which is shown in Fig. 2. In animals which survived for longer periods the kidney showed progressive degenerative changes, chiefly in the glomeruli (Fig. 3) and Bowman's capsule (Fig. 4). Accumulations of lymphoid cells also became prominent in areas affected by hæmorrhage and œdema. The accompanying micro-photographs illustrate the changes referred to above.

FIG. 4.



Section of rabbit's kidney showing marked thickening of Bowman's capsule. Stained by Mallory's method.

SUMMARY.

1. That nephritis may be hereditary, familial, or congenital is shown well in the families described by Hurst and others.

2. It would seem that a familial predisposition to nephritis exists in a series of cases instanced by us and notably in two families.

3. In one family there was an association of apoplexy and nephritis, six members of the family being affected by one or both. The discovered onset was at or after middle life.

4. In the second family there were seven cases, of which five were discovered in childhood or adolescence. Four of the cases in this family were diagnosed within a few weeks of one another. That the actual origin was not recent, but of some years' standing, is evident from the fact that the arteries in three were thickened, the blood pressure high, and the non-protein nitrogen of the blood high.

5. No definite ætiological factor could be found in these cases to account for either the nephritis, high blood pressure, or thickened arteries. Syphilis is discounted by a negative Wassermann reaction in all cases. There is no history of scarlet fever or influenza in any of the cases.

6. In one case there is a definite history of chill immediately preceding the onset of the disease.

7. Pure growths of non-hæmolytic streptococci were obtained from the blood and urine of two cases on admission to hospital.

8. Blood cultures carried out four months later yielded no growth.

9. A streptococcus was obtained twice from the urine of one case while in hospital, and again on his return for a later examination.

10. A feature of note in primary cultures was the delay and feeble nature of the growth, which only appeared between the third and sixth day of incubation.

11. The types of streptococci isolated from the blood and urine were biochemically identical with those obtained from the teeth, tonsils, and tonsillar region. Such streptococci commonly live as harmless saprophytes in the mouth and throat, but may become parasitic and associate themselves with subacute infections.

12. In addition to the presence of intrinsic weakness causing a "locus minoris resistentiæ" in the kidney, a possible extrinsic factor in the recurrent attacks of nephritis may possibly be due to streptococcal infections.

13. There is considerable evidence for the conclusion that the teeth and tonsils may be regarded as among the important primary sources of infection, and probable portals of entry for hæmatogenous infection. It is possible that repeated infections may occur at such times when the normal resistance of the tonsils and tissues is lowered from local or general causes. Such infections may exercise an exacerbating influence in the course of the disease.

14. The failure to confirm the result of the first bacteriological examination of the blood, and the negative findings in two of the cases, suggest a focal infection producing disease by periodic systemic invasion—that is, a transient bacteræmia with rapid localisation of the invading organism in such organs most susceptible to its power of invasion, resulting in a focal expression of infection. In the family studied the kidney appears to be singularly predisposed to infection and the most susceptible organ.

15. Experimental evidence is given on the causation of nephritis by a non-hæmolytic streptococcus isolated from cases of subacute nephritis.

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GRADUATED EXERCISE IN PULMONARY TUBERCULOSIS.

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During the years 1920, 1921, and 1922 graduated exercise was employed as a form of treatment at King Edward VII. Sanatorium in 624 cases of pulmonary tuberculosis. Table I. shows the results from the replies to inquiries sent out in 1924; Table II. shows the cases classified according to the Turban-Gerhardt classification; while Table III. gives the result of treatment according to the stage of the disease.

The fact that 78·1 per cent. of Group 1 cases and 53·7 per cent. of Group 3 cases are well emphasises the importance of early diagnosis and treatment. The death-rate of cases in Group 1 (5·3 per cent.) compared with the death-rate of cases in Group 3 (26·3 per cent.) has equal significance.

Not all the cases admitted to and discharged from the sanatorium in these years are included in the following tables, and in this sense the cases recorded are to be regarded as picked cases, inasmuch as only those cases were allowed to attempt any graduated exercises whose condition appeared to justify it, and only those cases are included whose condition and response enabled them to reach the higher grades. In considering the results of a particular form of treatment it has appeared reasonable only to include those patients who had actually experienced that treatment.

The theory of auto-inoculation has been the controlling principle in the graduation of the exercise, and the relation between toxic absorption and muscular action has been constantly controlled and observed.

Table I.—*Showing Results from Replies to Inquiries Sent Out in 1924.*

Well and at work or leading a normal life.	Not well.	Alive, no details.	Dead.	Not reported.	Total alive.
416 = 66·7 %	72 = 11·5 %	13 = 2·1 %	91 = 14·6 %	32 = 5·1 %	501 = 80·3 %

Table II.—*Turban-Gerhardt Classification.*

Group 1 .. 243 .... Group 2 .. 206 .... Group 3 .. 175.

Table III.—*Showing Results of Treatment according to Stage of Disease.*

—	Well and at work or leading a normal life.	Not well.	Alive, no details.	Dead.	Not reported.
G. 1	190 = 78·1 %	21 = 8·6 %	5 = 2·2 %	13 = 5·3 %	14 = 5·8 %
G. 2	132 = 64·1 %	25 = 12·1 %	6 = 3·0 %	32 = 15·5 %	11 = 5·3 %
G. 3	94 = 53·7 %	26 = 14·8 %	2 = 1·1 %	46 = 26·3 %	7 = 4 %

Symptoms which have been regarded as an indication of an excessive toxic absorption have been the following: an evening rise of temperature above 99° F. oral, slight headache, increase of cough and sputum, excessive fatigue, loss of appetite, aching in back or limbs, and general malaise. Table IV. shows the numerical occurrence of such symptoms and also shows that, as might be expected, the incidence increases as the stage of the disease advances.

Table IV.—*Showing Numerical Occurrence of Symptoms regarded as an Indication of Excessive Toxic Absorption.*

Group 1: Of 243 cases 73, or 30 per cent.
Group 2: Of 206 cases 80, or 39 per cent.
Group 3: Of 175 cases 92, or 53 per cent.

The maximum temperature recorded was 104·8° F., but this was exceptional, the rise usually observed being about 100°. The maximum number of such reactions to occur in any one case was nine. These reactions when observed were controlled by absolute rest in bed until the evening temperature returned to a normal level and the symptoms subsided, and the patient looked and felt well. He then returned by gradual stages to the grade of exercise which had caused the reaction. The maximum period for which an individual was kept on absolute rest was 21 days, and the shortest time taken to return to a grade of exercise after a reaction was three days. It is of interest to note that many cases of raised temperature accompanied by symptoms of toxæmia occurred immediately after admission to the sanatorium following the exertion of the journey, and also that the majority of the reactions occurred during the earlier stages of the treatment—e.g., walks of a mile or two, or the lighter grades of garden work.

Only those cases have been recorded as reactions which were immediately related to an increase of exercise and were accompanied by the usual symptoms of excessive toxic absorption. Rises of temperature which might be explained by other causes—e.g., dental trouble, constipation, or premenstrual rises—have not been included.

The grades of exercise progress from absolute rest in bed or no exercise at all, to being in bed all day but not on absolute rest, to being up for increasing periods during the day, to taking an increasing amount of walking exercise, and, only when the individual progress and condition permit, to exercises in gardens and grounds and recreations involving exercise such as golf.

All exercise is prescribed and carried out under close medical supervision. This is essential, not only n order to observe how each individual is responding, but also to prevent the prescription being exceeded. A non-medical supervisor is apt to regard the necessity of the work to be done as more important than the medical requirements of any particular case.

The attitude of mind referred to as "spes phthisica" is frequently marked in the later stages of the disease and is usually a bad prognostic feature. *It is conspicuous by its absence in the* earlier stages, a spirit of moroseness and depression being far more frequently observed. A significant feature of successfully conducted graduated exercise is the way in which a patient's cough and sputum diminish, the temperature excursions and variations become less marked, and depression gives way, not to a groundless hopefulness, but to a cheerful alertness, so that the individual's nature seems to have undergone an entire change for the better.

THE USE OF INSULIN IN OPERATIONS ON THE DIABETIC.

By H. S. PEMBERTON, M.B. LIVERP., M.R.C.P. LOND.,
PHYSICIAN TO THE DAVID LEWIS NORTHERN HOSPITAL, LIVERPOOL;
AND
L. CUNNINGHAM, M.B. CAMB., M.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO THE HOSPITAL.

ALTHOUGH the more recent dietetic methods of Allen and Joslin[1] have already begun to diminish the mortality following surgery in the diabetic, the use of insulin in selected cases seems to remove the risks altogether. These risks are, briefly, the liability to post-operative infection and the event of coma, and are mainly due to anæsthesia and shock, both of which produce the hyperglycæmia, the control of which is the main aim of management. In operations on the non-diabetic ether anæsthesia produces hyperglycæmia, glycosuria,[2] and a lowering of the alkali reserve.[3] In two cases which we investigated results were obtained as given in Table I. (values expressed as mg. per 100 c.cm. blood).

TABLE I.

—	Length of ether administration.	Arterial glucose.	Venous glucose.
1	15 mins.	110	100
2	40 mins.	171	150

It will be noted that the arterial value is higher than the venous, which we attribute to increased glycogenolysis in the liver.

In operations on the diabetic the rise in blood-sugar and the fall in alkali reserve are both greater, and, moreover, the glucose value of venous blood tends to become greater than that of the arterial blood, a condition which we have found to occur repeatedly in severe and untreated diabetics. This is shown in the following case (Table II.) which was operated on for umbilical hernia. Insulin was not used.

TABLE II.

Period.	Arterial glucose.	Venous glucose.	CO_2 vols. per cent.
Before operation	—	99	57
After ether induction—			
10 mins.	201	150	44·8
30 mins.	294	315	45·9
60 mins.	281	301	45·9

As will be shown below, insulin decreases ether-hyperglycæmia, but does not always succeed in producing what appears to be the typical insulin effect of raising the value of the glucose of arterial blood above that of the venous blood. Even after the administration of insulin the hyperglycæmia continues for several days, the length of time depending upon the original severity of the case, length and severity of the operation, and upon the occurrence of post-operative complications. Even when we have controlled the hyperglycæmia during operation we have found that it has subsequently been reproduced by post-operative sepsis; in support of this we have the figures of Joslin[4] for cases occurring in the Massachusetts General Hospital from 1913 to 1918. Here the mortality of diabetics with infection was 50 per cent., and without infection 12 per cent. The

TABLE III.

Time after induction of ether.	Arterial glucose.	Venous glucose.	CO_2 vols. per cent.	Insulin (c.cm.).	Diet.
CASE 1.—Subtotal hysterectomy in a woman aged 50. Ether 55 minutes.					
Before	—	162	53	0·5 (d.)	4F3P½C
10 mins.	193	218	36	—	—
20 mins.	—	—	—	0·8	—
30 mins.	231	238	35·5	—	—
90 mins.	214	232	38	—	—
2 days	—	300	35·7	0·5 (d.)	Milk*
3 days	—	188	61	1·0 (d.)	Milk
CASE 2.—Amputation of the toe on a man aged 64. Ether 10 minutes.					
Before	—	222	—	0·5	CHO free
5 mins.	200	143	42·8	—	—
15 mins.	—	—	—	0·5	—
20 mins.	192	191	49	—	—
45 mins.	187	187	30·6	—	—*
30 hrs.	—	580	60	1·0 (d.)	Milk
3 days	—	300	51	1·0 (d.)	"
* Bicarbonate of soda, gr. xxx., t.d.s.					
CASE 3.—Laparotomy on a man aged 52. Ether 30 minutes.					
Before	—	173	52	0·5 (d.)	3F3P1C
15 mins.	136	125	45	—	—
70 mins.	—	—	—	0·8	—
90 mins.	200	214	39	—	—
2 days	—	260	48	0·5 (d.)	Milk
10 days	—	139	51	0·5 (d.)	CHO free
CASE 4.—Amputation of toe on a man aged 60. Ether 20 minutes.					
Before	—	166	53	0·5 (d.)	3F3P1C
15 mins.	168	140	47·9	—	—
40 mins.	168	140	47·9	0·75	—
70 mins.	190	180	46·8	—	—
7 days	—	125	52·4	0·5 (d.)	CHO free
CASE 5.—Umbilical hernia in a man aged 44. Ether 20 minutes.					
Before	—	99	57	0·5 (d.)	4½F2P1C
10 mins.	205	150	44·8	—	—
30 mins.	294	315	45·9	—	—
60 mins.	281	301	45·9	—	—
24 hrs.	—	238	45·2	0·5 (d.)	CHO free
4 days†	—	500	57	1·0 (d.)	—
5 days	—	429	60	2·0 (d.)	—
12 days	—	196	53·5	1·0 (d.)	—
†Pyrexia and bronchitis.					
CASE 6.—Amputation of leg on a man aged 64. Ether 25 minutes.					
Before	—	200	51	2·0 (d.)	CHO free
10 mins.	120	120	45·4	—	—
25 mins.	113	120	41·5	0·5	—
45 mins.	96	93	42·3	—	—
24 hrs.	—	580	60	0·5 (d.)	CHO free
3 days	—	300	51	0·5 (d.)	"

(d.) = daily.

alkali reserve also remains low for several days unless alkalis are administered.

Technique.

The technique which we employed may be divided into the following stages.

1. *Preparation Before Operation.*—For this at least a week appears to be necessary, during which hyperglycæmia and acidosis are removed and the patient is brought into nitrogenous equilibrium by appropriate diet and insulin dosage which naturally varies in each case. We did not attempt to fill the liver with glycogen as advocated by Joslin[5] and Barborka.[6] No food was given on the day of operation, half an hour before which 10 units of insulin were given.

2. *During Operation.*—Ether was invariably employed as an anæsthetic and was administered by the open method. Blood was removed simultaneously from the radial artery and median basilic vein at intervals of 20 minutes. Half an hour after the induction of anæsthesia insulin was given in amounts varying with the nature of the case.

3. *After Operation.*—This appears to be the most critical period. The patient was put on a milk diet, and the dosage of insulin governed by the magnitude of the post-operative hyperglycæmia. In post-operative infection either in the wound or arising from pulmonary conditions the reduction of hyperglycæmia presented great difficulty. A low post-operative alkali reserve may be effectively removed by alkalis as in Case 1.

The method used for the determination of glucose in the blood was the one described by Folin and Wu.[7] The carbon dioxide combining power of the blood was estimated by Van Slyke's method.[8] Diets used are in accordance with a simple scheme devised by one of us.[9] Operations were performed by Mr. G. C. E. Simpson and Dr. Leith Murray. Ether was administered by the open method preceded by the usual hypodermics.

Summary.

Ether anæsthesia in the diabetic produces a more severe hyperglycæmia and a greater fall in the alkali reserve than in a non-diabetic. They may be controlled by the pre-, intra-, and post-operative use of insulin. In spite of the administration of insulin the post-operative complication of sepsis appears to maintain both hyperglycæmia and a low alkali reserve; the latter may be restored by alkali therapy.

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A CASE OF
METASTATIC GAS GANGRENE
IN CIVIL PRACTICE.

BY J. R. LEARMONTH, M.B., CH.B. GLASG.,
EXTRA DISPENSARY SURGEON, WESTERN INFIRMARY, GLASGOW.*

THE following case presents a clinical picture so rare as to merit publication.

C. W., a coalman, aged 35, was admitted to the Western Infirmary, Glasgow, on March 21st, 1924. He stated that he had swung himself up on his lorry while it was in motion, whereupon he was seized immediately with epigastric pain so severe that he fell upon the pavement, where he remained until the arrival of the ambulance which brought him to the infirmary. On admission the temperature (rectal) was 99·2° F., the pulse 118, and the respirations 24. The whole abdomen was board-like in its rigidity and exquisitely tender. The patient was in great agony and collapsed. There was no vomiting. It was found that for two years he had suffered at intervals from epigastric pain, which occurred shortly after meals; he had rarely vomited. The gastric symptoms had never been so severe as to force him to consult a doctor. A slight degree of constipation had been present for the same period.

A diagnosis of perforation of a gastric ulcer was made, and without delay I opened the abdomen through the upper part of the right rectus muscle. The peritoneal cavity contained a considerable quantity of turbid, straw-coloured fluid, which was removed with gauze sponges as completely as possible. Examination showed that the lesser curvature of the stomach, rather towards its pyloric end, was occupied by a large saddle-shaped ulcer. Attached to the peritoneum over the anterior half of this ulcer was a mass of partially organised fibrin about 2 inches in diameter, and in form like the top of a mushroom turned upside down. More recent adhesions bound this mass to the anterior edge and under surface of the left lobe of the liver. Tunnelling through its middle was a perforation which admitted the tip of the little finger. Invagination of the perforated ulcer was impossible owing to the presence of the bulky mass of fibrin; temporary drainage of the peritoneal cavity seemed insufficient in view of the length of the perforating passage and the hard unyielding character of its walls, so that primary V-shaped resection of the whole ulcerating area was decided upon as the only hopeful line of treatment. This was performed as rapidly as possible, silk being used for the outer Lembert suture and catgut for the inner suture. The incision was closed in layers without drainage, and a tube containing a gauze wick was placed in the recto-vesical pouch through a separate median suprapubic stab wound.

At the close of the operation the condition of the patient was very grave. On his return to the ward a pint of saline solution was administered by the rectum, and strophanthin gr. 1/250 was injected hypodermically; rectal salines (10 oz.) and strophanthin, gr. 1/250, were ordered to be given every four hours. On the following day the patient was still very ill—temperature 101·8° F., pulse 156, respirations 36. On the second morning after operation, however, his condition was markedly improved. The temperature was 99·2°, the pulse 112; and the respirations 28. The dose of strophanthin was reduced to gr. 1/250 every six hours. The improvement was well maintained throughout the day, but about midnight he complained of pain in his right upper arm, and the pulse-rate rose to 120. Examination showed a diffuse reddening of the outer wall of the right axilla, to which a wet dressing was applied. By the morning of the third day the temperature had risen to 102°, the pulse to 140, the respirations to 32, and he was slightly jaundiced. His general condition was obviously hopeless. Examination of the right arm revealed a diffuse swelling extending along the inner aspect of the arm from about 3 inches above the level of the elbow-joint to the apex of the axilla. The skin over this area was a dusky purple colour and insensitive and crepitation could be elicited over its whole extent. Two parallel longitudinal incisions were made throughout the whole length of the swelling; these allowed the escape of gas under considerable tension. The muscles on the inner aspect of the arm were pale, quite necrotic, and riddled with gas bubbles. The wounds were swabbed out with peroxide of hydrogen, and a wet dressing was applied.† The patient died at 1 P.M., exactly 72 hours after the perforation of his ulcer; he had exhibited to a marked degree the retention of mental faculties found in this type of infection.

Bacteriological Report.

A portion of the necrotic material from the arm, obtained during life, was examined in the clinical laboratory of the Western Infirmary by Dr. E. M. Dunlop, who reported:—

"No growth was obtained on aerobic cultures. Under anaerobic conditions a growth of a Gram-positive bacillus was obtained, and this culture, when plated, yielded abundant colonies which, macroscopically, were all of the same type. Twelve of these were subcultured in litmus-milk, and in each instance the characteristic "stormy" fermentation associated with *B. welchii* was obtained after a short period of incubation. In deep glucose-agar shake cultures the organism grew rapidly, and led to abundant gas production. Films made from the various cultures were examined; in each case the growth appeared to be pure, and the organism had the microscopic characters of *B. welchii*. It grew only

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[*] During the tenure of a grant from the Medical Research Council.

[†] Messrs. Burroughs, Wellcome and Co. inform me that they have still in stock antitoxic serum for administration in cases of gas gangrene due to *B. welchii*. As this serum was prepared some years ago they naturally do not guarantee its potency, but it might prove useful in such an emergency as described above.

under anaerobic conditions, and exposure of surface cultures to the air for a few hours was found to prevent growth on subsequent anaerobic subcultures. Spore formation has not been observed, and attempts to produce it have been unsuccessful."

Post-mortem Examination.

At the necropsy, performed by Dr. J. W. S. Blacklock 24 hours after death, the muscles on the inner side of the right upper arm were found to be necrotic. Numerous small gas cavities were present, and these extended into the tissues on the right side of the neck. Dissection revealed no evidence of embolism or thrombosis in the brachial artery or in its main branches in this region. The abdominal surgical incisions were healthy. A slight degree of plastic peritonitis was present, the coils of bowel being irregularly congested and matted together by fibrinous lymph. No leakage was found at any part of the repair of the stomach, and this wound appeared to be healing normally. The intestine showed no gross morbid change. The liver showed some fatty change, and small bubbles of gas could be expressed from the branches of the portal vein. The spleen was enlarged (weight 9 oz.), dark red, and firm. Slight fatty changes were present in the kidneys, which were otherwise healthy. The pericardial sac contained a small quantity of blood-stained fluid. The heart wall showed cloudy swelling and the endocardium was deeply stained with hæmoglobin. All the valves were healthy and competent. The intima of the aorta was deeply stained with hæmoglobin. The lungs showed well-marked recent venous congestion. In smears from the muscles of the arm were found large numbers of an organism morphologically resembling *B. welchii*, together with cocci. Culture of the muscle anaerobically showed the former organism. Smears and cultures from the spleen demonstrated the presence of an organism morphologically resembling *B. welchii* in practically pure culture. (The organisms other than *B. welchii* were doubtless due to post-mortem contamination—see bacteriological report on tissue obtained during life.) On section the gastric ulcer proved to be of the chronic inflammatory type. Some attempt at healing was present, and at one part of the base of the ulcer more recent acute inflammatory change was found.

Comment.

Gas gangrene is but rarely encountered in civil surgery; Christopher (1922)[1] found nine cases recorded by seven writers. Almost all the cases fall into two groups. In the first group gas gangrene occurs as a complication of various forms of injury sustained under conditions favouring infection from the soil. In the second group it follows septic abortion. Its occurrence has also been noted in the scrotum,[2] in the gall-bladder,[3] and as a complication of ischio-rectal abscess.[4]

The most unusual feature of the case reported is the metastatic nature of the gangrenous focus. Septicæmic and pyæmic manifestations in infections by gas-producing bacilli are to be regarded as complications of what is usually a local process which causes a profound toxæmia; although invasion of the blood by the causative organisms rapidly occurs after death. On the other hand, gas production is not uncommonly seen post mortem in the organs of subjects dying of other diseases; in these cases the bacilli enter the blood after death from the bowel, of which they are normal inhabitants. It is necessary in such cases to be cautious in assigning ætiological value to the results of examinations of material obtained in the post-mortem room.

Cases of metastatic gas gangrene following war wounds have been recorded.[5] The factors determining the sites of secondary foci appear to be slight local injury—for example, an hypodermic injection, or any interference with the blood-supply of the part, whether this be the result of injury to a main artery or of prolonged maintenance of one position, when the local ischæmia thus produced—for example, in the buttock—may determine gangrene. In the latter situation direct infection from the bowel cannot be excluded, and this was probably the source in the ischio-rectal case referred to above. Neither of these factors could be established in the case reported. The only injection given into the right arm was an attempt soon after the operation to introduce strophanthin into the median basilic vein immediately below the level of the elbow-joint, some 3 inches distal to the lower margin of the gangrenous area. Examination both before and after death revealed no sign of injury to the arm, and certainly there was no gross abrasion of skin. There can be little doubt that the infection originated in the alimentary tract, though the actual portal of entry into the blood-stream remains obscure. It is possible that the organisms were present in the stomach at the time of operation, when the vessels opening on the cut surfaces of the gastric wall would offer a channel; on the other hand, infection may have occurred through some minute area of the wall of the bowel partly devitalised by handling during the operation.

I am indebted to Prof. Archibald Young, to whose wards the patient was admitted, for permission to publish this case.

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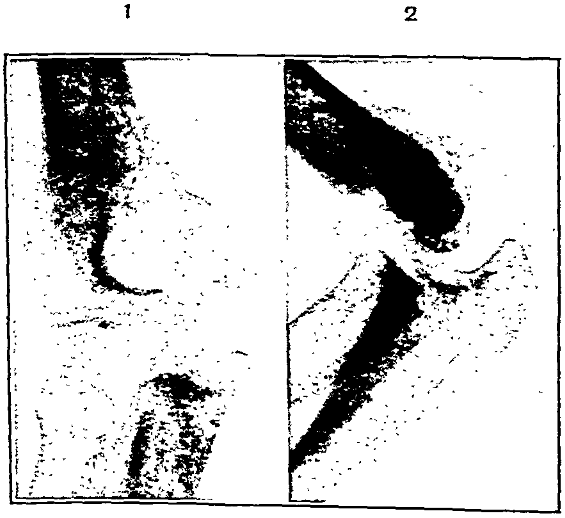
Clinical and Laboratory Notes.

INJURIES ABOUT THE ELBOW-JOINT.

By V. F. Soothill, M.D. Camb., D.P.H.,
ASSISTANT MEDICAL OFFICER OF HEALTH, ILFORD URBAN DISTRICT COUNCIL.

This is a plea for the more frequent use of X rays in the above class of injury. The following cases, illustrating the necessity, have attended the Ilford School Clinic in a little over a year:—

Case 1.—A. B., aged 8. This child fell and injured her left elbow and was seen by a medical man who was of opinion that there was no fracture. About three days later she attended the school clinic and the swelling aroused suspicion of a fracture, which was confirmed by X rays. She was sent by her doctor to hospital for treatment. The plates illustrating this fracture (Figs. 1 and 2) were kindly supplied from Great Ormond-street Hospital. The radiologist's report is, "Supracondylar fracture—comminuted. Slight inward and backward tilt of main fragment."



X ray illustrations showing fracture of elbow-joint (Case 1).

Case 2.—C. D., aged 7. The history of this case was given as follows. The boy fell on Jan. 16th, 1924, and injured his right elbow. He received treatment from a medical man, who said that the child need not attend again. A week later, dissatisfied with the condition of the boy's arm, the parent brought him to the school clinic. The alkali reserve also remains low for several days unless alkalis are administered.

Technique.

The technique which we employed may be divided into the following stages.

1. *Preparation Before Operation.*—For this at least a week appears to be necessary, during which hyperglycæmia and acidosis are removed and the patient is brought into nitrogenous equilibrium by appropriate diet and insulin dosage which naturally varies in each case. We did not attempt to fill the liver with glycogen as advocated by Joslin [5] and Barborka.[6] No food was given on the day of operation, half an hour before which 10 units of insulin were given.

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C. W., a coalman, aged 35, was admitted to the Western Infirmary, Glasgow, on March 21st, 1924. He stated that he had swung himself up on his lorry while it was in motion, whereupon he was seized immediately with epigastric pain so severe that he fell upon the pavement, where he remained until the arrival of the ambulance which brought him to the infirmary. On admission the temperature (rectal) was 99·2° F., the pulse 118, and the respirations 24. The whole abdomen was board-like in its rigidity and exquisitely tender. The patient was in great agony and collapsed. There was no vomiting. It was found that for two years he had suffered at intervals from epigastric pain, which occurred shortly after meals; he had rarely vomited. The gastric symptoms had never been so severe as to force him to consult a doctor. A slight degree of constipation had been present for the same period.

A diagnosis of perforation of a gastric ulcer was made, and without delay I opened the abdomen through the upper part of the right rectus muscle. The peritoneal cavity contained a considerable quantity of turbid, straw-coloured fluid, which was removed with gauze sponges as completely as possible. Examination showed that the lesser curvature of the stomach, rather towards its pyloric end, was occupied by a large saddle-shaped ulcer. Attached to the peritoneum over the anterior half of this ulcer was a mass of partially organised fibrin about 2 inches in diameter, and in form like the top of a mushroom turned upside down. More recent adhesions bound this mass to the anterior edge and under surface of the left lobe of the liver. Tunnelling through its middle was a perforation which admitted the tip of the little finger. Invagination of the perforated ulcer was impossible owing to the presence of the bulky mass of fibrin; temporary drainage of the peritoneal cavity seemed insufficient in view of the length of the perforating passage and the hard unyielding character of its walls, so that primary V-shaped resection of the whole ulcerating area was decided upon as the only hopeful line of treatment. This was performed as rapidly as possible, silk being used for the outer Lembert suture and catgut for the inner suture. The incision was closed in layers without drainage, and a tube containing a gauze wick was placed in the recto-vesical pouch through a separate median suprapubic stab wound.

At the close of the operation the condition of the patient was very grave. On his return to the ward a pint of saline solution was administered by the rectum, and strophanthin gr. 1/250 was injected hypodermically; rectal salines (10 oz.) and strophanthin, gr. 1/250, were ordered to be given every four hours. On the following day the patient was still very ill—temperature 101·8° F., pulse 156, respirations 36. On the second morning after operation, however, his condition was markedly improved. The temperature was 99·2°, the pulse 112; and the respirations 28. The dose of strophanthin was reduced to gr. 1/250 every six hours. The improvement was well maintained throughout the day, but about midnight he complained of pain in his right upper arm, and the pulse-rate rose to 120. Examination showed a diffuse reddening of the outer wall of the right axilla, to which a wet dressing was applied. By the morning of the third day the temperature had risen to 102°, the pulse to 140, the respirations to 32, and he was slightly jaundiced. His general condition was obviously hopeless. Examination of the right arm revealed a diffuse swelling extending along the inner aspect of the arm from about 3 inches above the level of the elbow-joint to the apex of the axilla. The skin over this area was a dusky purple colour and insensitive and crepitation could be elicited over its whole extent. Two parallel longitudinal incisions were made throughout the whole length of the swelling; these allowed the escape of gas under considerable tension. The muscles on the inner aspect of the arm were pale, quite necrotic, and riddled with gas bubbles. The wounds were swabbed out with peroxide of hydrogen, and a wet dressing was applied.† The patient died at 1 P.M., exactly 72 hours after the perforation of his ulcer; he had exhibited to a marked degree the retention of mental faculties found in this type of infection.

Bacteriological Report.

A portion of the necrotic material from the arm, obtained during life, was examined in the clinical laboratory of the Western Infirmary by Dr. E. M. Dunlop, who reported:—

"No growth was obtained on aerobic cultures. Under anaerobic conditions a growth of a Gram-positive bacillus was obtained, and this culture, when plated, yielded abundant colonies which, macroscopically, were all of the same type. Twelve of these were subcultured in litmus-milk, and in each instance the characteristic "stormy" fermentation associated with *B. welchii* was obtained after a short period of incubation. In deep glucose-agar shake cultures the organism grew rapidly, and led to abundant gas production. Films made from the various cultures were examined; in each case the growth appeared to be pure, and the organism had the microscopic characters of *B. welchii*. It grew only

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* During the tenure of a grant from the Medical Research Council.

† Messrs. Burroughs, Wellcome and Co. inform me that they have still in stock antitoxic serum for administration in cases of gas gangrene due to *B. welchii*. As this serum was prepared some years ago they naturally do not guarantee its potency, but it might prove useful in such an emergency as described above.

The following Regulations will apply to all candidates who pass the Preliminary Examination in General Education on or after Jan. 1st, 1923.

1. Candidates for the Licence in Dental Surgery of the Royal College of Surgeons of England are required to pass one of the Examinations in General Education recognised by the Conjoint Examining Board in England, and the Pre-Medical Examination in Chemistry and Physics conducted by that Board or one of the examinations recognised in lieu thereof, before they commence the curriculum of professional study for the Licence extending over four years.

2. Candidates who produce evidence of having been registered by the General Medical Council as Medical or Dental Students on or after Jan. 1st, 1923, will be considered to have passed the required Preliminary Examination in General Education and the Pre-Medical Examination.

3. Candidates who hold the degree of D.M.D. Harvard, D.D.S. Pennsylvania, D.D.S. Michigan, D.D.S. Illinois, D.D.S. St. Louis, Missouri, D.D.S. Northwestern University, Chicago, D.D.S. Minnesota, D.D.S. Sydney, or the Licence of the Dental Board of Victoria, Australia, are not required to pass these *Examinations.*

First Professional Examination.—1. The First Professional Examination consists of Part I. Dental Mechanics, Part II. Dental Metallurgy, and Part III. Section (*a*) General Anatomy and Physiology, Section (*b*) Dental Anatomy and Physiology, and is held in January or February, April, and September or October in each year.

2. Candidates may present themselves for the several Parts of the First Professional Examination together or separately, but before admission to any part of the Examination they must produce evidence of having passed the required Preliminary Examination in General Education and the required Pre-Medical Examination or a certificate of having been registered as a Medical or Dental Student by the General Medical Council.

Part I. *Dental Mechanics.*—3. This Examination is a practical one, conducted in the Mechanical Laboratory of one of the Dental Hospitals in London.

4. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward certificates :—

(1) Of having been engaged during a period of not less than two years in acquiring a practical familiarity with the details of Dental Mechanics. One year at least of this study must be taken in the Mechanical Department of a recognised Dental Hospital where the arrangements for teaching Dental Mechanics are satisfactory to the Board of Examiners in Dental Surgery. Part or the whole of the rest of the course may be taken as a pupil with a competent dentist provided that time spent as a private pupil shall be at least twice the time required for the corresponding instruction[*] taken at a Dental School.

(2) Of having attended at a recognised Dental Hospital and School: (*a*) A course of lectures on Dental Mechanics; (*b*) a course of Practical Dental Mechanics, including the manufacture and adjustment of 6 dentures and 6 crowns.

6. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having received three months further instruction under the conditions specified in Certificate (1) paragraph 4.

Part II. *Dental Metallurgy.*—7. This Examination is conducted by written paper.

8. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward a certificate :—Of having attended at a recognised Dental Hospital and School: (*a*) A course of lectures on Dental Metallurgy; (*b*) a course of Practical Dental Metallurgy.

9. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having received, subsequently to the date of reference, not less than three months' instruction in Dental Metallurgy in a recognised Dental School.

Part III. (*a*) *General Anatomy and Physiology*, (*b*) *Dental Anatomy and Physiology.*—10. This Examination is partly written and partly oral.

11. Candidates may enter for Section (*a*) only or for Sections (*a*) and (*b*) together on producing the required certificates, but they will not be allowed to proceed with Section (*b*) until they have passed in Section (*a*). In the case of a candidate who enters for both Sections and fails in Section (*a*) the fee paid for admission to Section (*b*) will not be forfeited, but will be credited to the candidate on readmission to examination in that Section. Candidates who enter for both Sections together may pass in Section (*a*) although failing to pass in Section (*b*).

12. Candidates must give 21 days' notice in writing of their intention to present themselves for the whole or for one Section of this examination and at the same time forward certificates :—

(1) For Part III. (*a*). Of having attended at a recognised Medical School: (*a*) Courses of instruction in Anatomy, including special demonstrations on prepared dissections during three terms; (*b*) a course of dissections to include, if possible, the head and neck, during one term; (*c*) courses of instruction in Physiology including General Biology, Biochemistry, and Biophysics, during three terms; (*d*) a course of instruction in Histology.

(2) For Part III. (*b*). Of having attended at a recognised Dental School: (*a*) A course of instruction in Dental Anatomy and Physiology; (*b*) a separate course of instruction in Dental Histology, including the preparation of Microscopical Sections.

13. A candidate referred at this examination who does not hold a registrable Dental Qualification will be required, before readmission to Section (*a*), to produce a certificate of three months' additional study of Anatomy and Physiology at a recognised Medical School, and will be required before readmission to Section (*b*) to produce a certificate of three months' additional study of Dental Anatomy and Physiology at a recognised Dental School.

14. *Exemptions.*—Candidates who have passed Section I. of the First Professional Examination of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Anatomy and Physiology for a degree, or other qualification, in Medicine or Surgery, registrable under the Medical Act of 1886, or for the degree of M.B. or M.D. of a Foreign or Colonial University recognised by the Conjoint Examining Board in England, are not required to pass Section (*a*).

Second Professional Examination.—1. The Second Professional Examination is held in February, May or June, and November in each year, and consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery.

2. Candidates who have passed the First Professional Examination at least six months[†] previously may present themselves for Part I. only on producing the certificates mentioned in paragraph 6 of this section, or they may enter for the whole Examination at one time on producing the certificates mentioned in paragraphs 6 and 10 of this section.

3. Candidates must pass in Part I. before proceeding to Part II.

4. Candidates who enter for the whole Examination at one time may pass in Part I. although failing to pass in Part II.; but if they fail to pass in Part I. they will not be allowed to proceed with the Practical and Oral Examinations in Part II. In such cases the fee paid for admission to Part II. will not be forfeited, but will be held over until such time as the candidate is readmitted to examination in that Part.

Part I. *General Surgery and Pathology.*—5. This Examination is partly written and partly oral.

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[*] This instruction may be taken prior to the date of passing the Examination in General Education and the Pre-Medical Examination, but will not be counted as part of the required four years of professional study unless taken after passing the Pre-Medical Examination.

[†] The interval of six months is not required in the case of a colonial or foreign dentist.

nature of the swelling suggested a fracture, which was confirmed by X rays. He was transferred to hospital for treatment. He still has considerable deformity and limitation of extension. The radiologist's report is, "Separated epiphysis, lower end of humerus, with backward displacement."

CASE 3.—E. F., aged 13. Fell and injured his left elbow on March 17th, 1924. He attended the school clinic next day. There was some swelling and, as I could not exclude fracture, he was X rayed. There was no fracture. I saw him again four days later and the swelling presented the typical appearance of fluid in the joint. I include this case for comparison with Case 4.

CASE 4.—G. H., aged 8. This boy fell and injured his left elbow on March 21st, 1924. He attended the school clinic next morning (Saturday). There was a little swelling, but I could find no evidence of fracture, and considered it a case of synovitis like Case 3. An X ray was unobtainable that day, so the arm was bandaged to the chest in a flexed position, and the mother instructed to return with him on Monday. On the Monday the extent of the swelling suggested a fracture, which was confirmed by X rays, and the boy was transferred to hospital for treatment. The radiologist's report was, "Separated epiphysis, lower end of humerus. No displacement."

Of these four consecutive cases of injury to the elbow, three were fractures and not one of them was diagnosed when first seen. Probably they were not diagnosable except by skiagram, as Cases 1 and 2 had both been seen by medical practitioners who had not informed the parents of any fracture; and I could not tell the difference, on first seeing them, between Cases 3 and 4, although one had a fracture and the other had not. The necessity for discovering definitely the presence of fracture, even if "only" a separated epiphysis, is shown by the poor result in Case 2. If an X ray is not obtainable immediately, the case should be seen again, and if there be any suspicion of fracture a skiagram should be obtained even at the cost of some trouble. I have found that a generalised swelling, not confined to the synovial membrane and still seen on and after the third day, strongly suggests the advisability of obtaining a skiagram.

I am indebted to Dr. A. H. G. Burton, medical officer of health of Ilford, for permission to publish these cases.

VAGINAL HÆMORRHAGE FROM PERFORATING ENDOTHELIOMA.

BY W. B. COSENS, M.R.C.S. ENG.,
HON. SURGEON, DORSET COUNTY HOSPITAL.

THE rarity of this condition and the youth of the patient justify recording this case of alarming vaginal hæmorrhage.

Miss ——, aged 20, had been apparently in excellent health, the last period having ended 14 days previously. At 7 A.M. she was seized with severe vaginal hæmorrhage. Dr. T. B. Broadway, of Dorchester, found, under an anæsthetic, a large tumour pressing down the anterior wall of the vagina, but was unable to palpate the cervix. There was a well-formed hymen.

On admission to hospital the hæmorrhage continued in spite of gauze-packing. A hard, but slightly resilient, mass was felt resembling in contour a seven months' pregnancy. The abdomen was opened and a tumour was shelled out of the retroperitoneal space between the bladder and vagina; it was adherent to the anterior vaginal wall. The tumour weighed 1 lb. 2 oz. There was an abscess between the anterior fornix and the adherent part of the tumour, the hæmorrhage being due to perforation of the vaginal arteries in the site of the abscess cavity. Owing to the total disorganisation of the upper portion of the vagina, and its septic condition, the uterus was removed.

Pathological Report.—"An encapsulated, solid, and capillary fibro-hæmangio-endothelioma of vaginal wall."

The patient is now in excellent health. It is a question of doubt if she should receive X ray vaginal treatment, the ovaries being left and apparently healthy. The specimen is to be shown by Dr. Russell Andrews at the next meeting of the Section of Obstetrics and Gynæcology, Royal Society of Medicine.

STUDENTS' GUIDE—SESSION 1924-25.

DENTAL SURGERY.

APPEARANCE on the Medical Register entitles a practitioner to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but few dental appointments at general or special hospitals or dispensaries are available save to those with a special diploma.

In THE LANCET of August 30th (p. 477) we outlined the constitution of the Dental Board of the United Kingdom, and the regulations in regard to the registration of dental students. In the following syllabus the respective requirements of the various examining bodies in dentistry are set forth, together with the facilities for dental study offered by certain other institutions.

THE EXAMINING BODIES IN DENTISTRY.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND grants a diploma in Dental Surgery under the following regulations, which apply to all candidates who have passed the required Preliminary Examination in General Education before Jan. 1st, 1923.

Candidates are required to pass three examinations: the Preliminary Science Examination, the First Professional Examination, and the Second Professional Examination. 1. Preliminary Science Examination.—This is identical with Part I. of the First Examination of the Examining Board in England. Candidates who commenced professional study on or after Oct. 1st, 1913, must pass the Preliminary Science Examination before commencing the courses required for the Second Professional Examination. 2. The First Professional Examination.—The candidate must produce evidence of instruction in Dental Metallurgy and Practical Dental Mechanics. The Examination consists of Part I. (Mechanical Dentistry), Part II. (Dental Metallurgy), the examination in Dental Metallurgy being by written paper, and Part III. (*a*) General Anatomy and Physiology, (*b*) Dental Anatomy and Physiology conducted by papers and vivâ voce examination. The parts may be taken together or separately. 3. The Second Professional Examination.—This is divided into two parts: (*a*) the General, (*b*) the Dental. The General part must be passed before the Dental portion. The instruction is obtained partly at a General Hospital and partly at a Dental Hospital. The Second Professional Examination consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery. There is a written and vivâ voce examination in each part and a practical examination as well in Part II. Exemption from the Preliminary Science Examination is granted to candidates who have passed an Examination in Chemistry and Physics for a degree in Medicine at a University in the United Kingdom, in India, or in a British colony. Exemption from Examination in Anatomy and Physiology is granted to candidates who have passed the Second Examination of the Examining Board in England or the corresponding Examination for any degree or qualification in Medicine or Surgery registrable under the Medical Act of 1886. Exemption from Examination in General Surgery and Pathology is granted to candidates who have passed the Examination in Surgery of the Examining Board in England or the corresponding Examinations of the Colleges and University above mentioned. The fee for the diploma is 20 guineas, and is payable as follows: Preliminary Science Examination, for each admission to Part I., £3 3*s.*; Part II., £2 2*s.* First Professional Examination, for each admission to Part I., £4 4*s.*; Part II., £1 1*s.*; Part III. (*a*) £2 2*s.*; (*b*) £2 2*s.*; Second Professional Examination, for each admission to Part I., £2 2*s.*; Part II., £4 4*s.*

will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

Royal Faculty of Physicians and Surgeons of Glasgow.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical; and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow. Candidates applying for Regulations should state date of commencement of curriculum.

Royal College of Surgeons in Ireland.—Candidates for the Licence in Dental Surgery, aged at least 21, pass two professional examinations. Before the First Examination the candidate must produce evidence of having attended courses in Theoretical and Practical Chemistry, including Metallurgy and Physics, at a recognised institution; of having been registered as a medical or dental student by the General Medical Council; and of having attended courses of instruction in the following subjects at a recognised school of medicine: (*a*) Anatomy Lectures; (*b*) Dissections with Demonstrations; (*c*) Physiology, including Dental Physiology; (*d*) Practical Physiology and Histology, including Dental Physiology and Histology, Human and Comparative. Before the Final Dental Examination the candidate must have been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the Mechanical Department of a recognised Dental Hospital, and have attended, at institutions recognised by the College for the purpose, the following courses of instruction: (*a*) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (*b*) Dental Mechanics. Lectures. Two courses. (*c*) Dental Anatomy. Lectures. One course. (*d*) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Two years. He must also have attended Clinical instruction at a recognised General Hospital during the ordinary teaching sessions (nine months), and have been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a medical or dental student. One year's bona-fide apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study. In the First Dental Examination candidates will be examined in (A) Physics and Chemistry, including Practical Chemistry and Metallurgy. (B) Anatomy, Physiology, and Histology—General and Dental. All the subjects may be passed at the same time, or they may be passed in two groups (A and B).

In the Final Dental Examination candidates will be examined in General Pathology, Medicine, and Surgery; Dental Surgery, and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery; Dental Mechanics and Metallurgy; Orthodontia. Candidates must pass in all the subjects at one examination. The total fee for the Diploma in Dental Surgery is 20 guineas.

University of Birmingham.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum: The "John Humphreys Odontological Museum." An Entrance Exhibition, value £37 10s., is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—

1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees. 3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. *A*. In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (*a*) Elementary Biology and Organic Chemistry, (*b*) Anatomy and Practical Anatomy, and (*c*) Physiology and Practical Physiology. *B*. That he has passed the class examinations in: (*d*) One Special Course of Lectures on Medicine, (*e*) One Special Course of Lectures on Surgery, and (*f*) Pathology and Bacteriology. *C*. That he has attended courses and passed the class examinations in: (*g*) Dental Histology and Patho-Histology, (*h*) Comparative Dental Anatomy, and (*k*) Dental Surgery and Prosthetic Dentistry. *D*. That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes *C* and *D*. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work, and investigations in some subject connected with Dentistry, which theses shall be submitted to examiners to be nominated by the Dental Advisory Board.

University of Bristol.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than four years after passing the first examination in the subjects of Chemistry and Physics, of which three shall have been passed in the University. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Biology, and the curriculum extends over one year.* The Third Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for three years an approved pupilage in Dental Mechanics.† The Second Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental

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* Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

† This pupilage must be taken either in the University laboratories or those of some institution recognised for the purpose by the University.

6. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates:—

(1) Of having attended at a recognised Medical School: (a) A course of instruction[‡] in Surgery during two terms; (b) a course of instruction in Medicine during two terms; (c) a course of instruction in General Pathology (including Bacteriology) during two terms. (2) Of having acted as Surgical Dresser in the Out-patient Department of a recognised Hospital for three months. (3) Of having attended, at a recognised Hospital or Hospitals, the practice of Medicine and Surgery, including clinical lectures, for 12 months. (4) Of being 21 years of age.

7. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of such additional study during three months at a recognised Medical School and Hospital as the Teachers of the School may determine.

Exemptions.—8. Candidates who are Members of the College or who have passed the Examination in Surgery of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Surgery for a Degree, or other Qualification in Medicine or Surgery registrable under the Medical Act of 1886, are not required to pass Part I. of the Second Professional Examination.

Part II. *Dental Surgery and Pathology.*—This Examination is partly written, partly oral, and partly practical. The oral examination is conducted by the use of preparations, casts, drawings, &c. At the practical examination candidates may be examined:—

(a) On the treatment of Dental Caries, on the preparation and treatment of teeth by filling with gold or other material, by inlaying or by crowning, and on other operations in Dental Surgery. (Candidates must provide their own instruments.) (b) On the treatment of abnormalities of position of the teeth of children. (c) On Clinical cases.

10. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates:—

(1) Of having been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a Medical or Dental Student, or of having passed the Pre-Medical Examination conducted or recognised by the Conjoint Examining Board in England. (2) Of having attended at a recognised Dental Hospital and School: (a) A course of Dental Surgery and Pathology; (b) a separate course of Practical Dental Surgery; (c) a course of Dental Bacteriology; (d) a course of Dental Materia Medica; (e) a course of practical instruction in the administration of such Anæsthetics as are in common use in Dental Surgery. (3) Of having attended at a recognised Dental Hospital and School, or in the Dental Department of a recognised General Hospital, the practice of Dental Surgery during two years.

11. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required before admission to re-examination to produce a certificate of three months' additional study at a recognised Dental Hospital.

Fees.—The fee for the Diploma in Dental Surgery is 20 Guineas.

Synopses of examinations and all further information can be obtained from the Secretary, Examination Hall, Queen-square, London, W.C. 1.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.—Regulations giving a list of Preliminary Examinations recognised for obtaining the Licence in Dental Surgery, as well as of the subjects of the Professional Examinations, may be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, at 49, Lauriston-place, Edinburgh. Candidates must produce certificates of having, subsequently to the date of registration, been engaged for four years in professional studies and of three years' instruction in Mechanical Dentistry from a registered dental practitioner, except in the case of previously registered medical practitioners, when two years will be considered sufficient. Candidates must also have attended a course of instruction at a University or in an established school of medicine or in a provincial school specially recognised by the College as qualifying for the Diploma in Surgery. In addition they will be required to have attended in a recognised dental hospital, or with teachers recognised by the College, special courses of lectures and instruction in Anatomy and Physiology (Human and Comparative), Surgery, Pathology, Materia Medica, Dental Histology, and Practical Dental Mechanics and Metallurgy; two years' attendance at a dental hospital or the dental department of a general hospital recognised by the College. Practical instruction in Mechanical Dentistry from a registered Dentist, or in the Mechanical Department of a recognised Dental Hospital and School, for three years. Candidates who have passed the First and Second Examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the subsequent Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the First and Second Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are Licentiates of this College or who may be registered medical practitioners will be required to produce certificates of attendance on the special subjects only and will be examined in these only for the dental diploma. First Professional Examination: The candidate must have attended the required courses. The examination embraces (1) Chemistry and Physics; and (2) Anatomy and Physiology. The fee is £5 5s. for the complete examination, and £3 3s. is payable for each division. In all cases of rejected candidates the fee for re-entry is £3 3s. Second Examination: The candidate must have attended the remaining courses of the curriculum, must produce certificates showing that he is 21 years of age, and must pay a fee of £10 10s., for re-entry £5 5s. The examination embraces (1) Surgery and Medicine; and (2) the special subjects of Dental Anatomy and Physiology, Dental Surgery and Pathology, Dental Materia Medica, Dental Mechanics and Dental Metallurgy, with a practical as well as the written and oral examinations in the subjects of Dental and Oral Surgery, Pathology, and Mechanics. The candidate will be tested in the Treatment of Dental Diseases, in Operative Dentistry, the Administration of Anæsthetics, Orthodontics, and in Prosthetic and Mechanical Dentistry. Candidates who claim exemption from the First Dental Examination on the ground of having passed the First and Second Triple Qualification Examinations or other recognised examinations will, before being admitted to the Second Dental Examination, be required to pay the total fee of £15 15s. payable for the dental diploma. Candidates applying for copies of Regulations should state date of registration as a dental student. Fees and schedules must be lodged with the Clerk not later than one week before the examination.

Separate Regulations are issued for candidates registered as Dental Students after Jan. 1st, 1923, for whom there is a much more extended course.

Higher Dental Diploma.—The College grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification. Every candidate for the Higher Dental Diploma shall produce evidence that he has been engaged in the study or practice of his profession as a Registered Dentist for at least one year subsequent to his having obtained the Licence in Dental Surgery of the College, or a Licence or Qualification in Dental Surgery specially recognised by the College. Particulars as to the examinations can be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, 49, Lauriston-place, Edinburgh. The fee payable by Licentiates of the College is £15 15s. For all other candidates £21. A fee of £10 10s. is retained for examination expenses in the case of referred candidates.

The examination embraces the following branches of Dental Science and practice: Dental Surgery, Anatomy, Pathology and Bacteriology, Prosthesis, Anæsthesia, and Dental Radiology. The examination will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

[‡] These courses of instruction must be attended after the completion of the courses in Anatomy and Physiology.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical; and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow. Candidates applying for Regulations should state date of commencement of curriculum.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Candidates for the Licence in Dental Surgery, aged at least 21, pass two professional examinations. Before the First Examination the candidate must produce evidence of having attended courses in Theoretical and Practical Chemistry, including Metallurgy and Physics, at a recognised institution; of having been registered as a medical or dental student by the General Medical Council; and of having attended courses of instruction in the following subjects at a recognised school of medicine: (a) Anatomy Lectures; (b) Dissections with Demonstrations; (c) Physiology, including Dental Physiology; (d) Practical Physiology and Histology, including Dental Physiology and Histology, Human and Comparative. Before the Final Dental Examination the candidate must have been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the Mechanical Department of a recognised Dental Hospital, and have attended, at institutions recognised by the College for the purpose, the following courses of instruction: (a) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (b) Dental Mechanics. Lectures. Two courses. (c) Dental Anatomy. Lectures. One course. (d) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Two years. He must also have attended Clinical instruction at a recognised General Hospital during the ordinary teaching sessions (nine months), and have been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a medical or dental student. One year's bona-fide apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study. In the First Dental Examination candidates will be examined in (A) Physics and Chemistry, including Practical Chemistry and Metallurgy. (B) Anatomy, Physiology, and Histology—General and Dental. All the subjects may be passed at the same time, or they may be passed in two groups (A and B).

In the Final Dental Examination candidates will be examined in General Pathology, Medicine, and Surgery; Dental Surgery, and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery; Dental Mechanics and Metallurgy; Orthodontia. Candidates must pass in all the subjects at one examination. The total fee for the Diploma in Dental Surgery is 20 guineas.

UNIVERSITY OF BIRMINGHAM.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum: The "John Humphreys Odontological Museum." An Entrance Exhibition, value £37 10s., is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—

1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees. 3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. *A*. In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (a) Elementary Biology and Organic Chemistry, (b) Anatomy and Practical Anatomy, and (c) Physiology and Practical Physiology. *B*. That he has passed the class examinations in: (d) One Special Course of Lectures on Medicine, (e) One Special Course of Lectures on Surgery, and (f) Pathology and Bacteriology. *C*. That he has attended courses and passed the class examinations in: (g) Dental Histology and Patho-Histology, (h) Comparative Dental Anatomy, and (k) Dental Surgery and Prosthetic Dentistry. *D*. That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes *C* and *D*. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work, and investigations in some subject connected with Dentistry, which theses shall be submitted to examiners to be nominated by the Dental Advisory Board.

UNIVERSITY OF BRISTOL.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than four years after passing the first examination in the subjects of Chemistry and Physics, of which three shall have been passed in the University. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Biology, and the curriculum extends over one year.* The Third Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for three years an approved pupilage in Dental Mechanics.† The Second Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental

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* Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

† This pupilage must be taken either in the University laboratories or those of some institution recognised for the purpose by the University.

Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall have passed an entrance examination satisfactory to the University before being admitted to any professional examination; the curriculum extends over four years from the date of passing a preliminary science examination in Chemistry and Physics. A three years' pupilage in Mechanical Dentistry is required[†] and four examinations must be passed, the subjects of which agree with those of the B.D.S. Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

UNIVERSITY OF DURHAM.—Every Dental student must, at the commencement of his studentship, be registered in the manner and under the conditions prescribed for Medical students.

First Examination for the Licence in Dental Surgery: This examination consists of two parts, which may be passed separately. Part 1, Biology, Organic Chemistry. Part 2, Theoretical Dental Mechanics, Dental Metallurgy (theoretical and practical). Second Examination: Anatomy, Physiology (including Biochemistry and Biophysics), Dental Anatomy and Dental Histology. Third Examination: Pathology and Bacteriology, Practical Dental Mechanics, Dental Materia Medica and Therapeutics. Final Examination: Medicine, Surgery, Dental Surgery and Pathology, Orthodontics, Operative Dental Surgery, and Dental Prosthetics, and Anæsthetics.

A candidate before presenting himself for examination is required to furnish certificates of instruction in the following subjects, attended after registration as a dental student at recognised Colleges or Schools: (*a*) Organic Chemistry; (*b*) Elementary Biology[‡]; (*c*) Human Anatomy, with dissections and demonstrations for three academic terms; (*d*) Physiology, including Biochemistry and Biophysics (with laboratory instruction, including practical Histology) for three academic terms; (*e*) General Pathology (including Bacteriology) for two academic terms; (*f*) Medicine for two academic terms; (*g*) Surgery for two academic terms; (*h*) the practice of a recognised General Hospital or Hospitals of not less than 80 beds, with certified instruction in Clinical Medicine and Clinical Surgery, for four academic terms. The certificates of teaching at General Hospitals must furnish evidence of the student having acted as Medical Clinical Clerk and Surgical Dresser, and of attendance in the Out-patient or Casualty Departments. A certificate of clinical instruction in Venereal Disease is required.

The candidate must have attended at a recognised Dental School courses of instruction in the following special subjects: (*a*) Dental Anatomy and Physiology, human and comparative. The course should comprise a minimum of 20 meetings of the class. (*b*) Practical Dental Histology and Morbid Histology. The course should comprise a minimum of 16 meetings of the class. (*c*) Dental Pathology and Surgery. The course should comprise a minimum of 20 meetings of the class. (*d*) Dental Materia Medica and Therapeutics. The course should comprise a minimum of 16 meetings of the class. (*e*) Dental Metallurgy (with practical work and demonstrations). The course should comprise a minimum of 20 meetings of the class. (*f*) Dental Mechanics (with practical work and demonstrations). The course should comprise a minimum of 20 meetings and 20 demonstrations. (*g*) A course of instruction in the use of Anæsthetics, general and local, employed in Dental Practice. (*h*) A course of instruction in Radiology as applied to Dentistry.

Note.—A candidate must produce a certificate of having administered general anæsthetics on at least ten occasions.

The candidate must have for at least 24 calendar months attended, during the ordinary academic terms, the practice of a recognised Dental Hospital or of the recognised Dental Department of a General Hospital, and have received for not less than 24 calendar months practical instruction in Dental Mechanics.

Note.—No portion of such practical instruction which is taken prior to the date of registration shall be reckoned as a portion of the four years of Professional Study required.

Instruction in Dental Mechanics should, if possible, be taken at a recognised Dental Hospital and School. If any part of such instruction be taken by the candidate as a pupil with a registered dentist the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a Dental Hospital and School.

Degree of Bachelor of Dental Surgery (*B.D.S.*).—(*a*) For students taking their complete course of instruction in the University. Such students must pass the same matriculation tests as medical students, and the same pre-registration examination in Inorganic Chemistry and Physics. After registration students must spend five years in the University, on attendance on such subjects as Senate, on the recommendation of the Board of the Faculty of Medicine, may from time to time determine. They must attend the practice of the Newcastle-upon-Tyne Dental Hospital for not less than two and a half years. Six months of this time must be devoted to the study of the higher branches of dental science. There are four examinations.

The subjects of the *first* examination are Biology and Organic Chemistry, of the same standard as for medical students; and Dental Mechanics and Metallurgy.

The subjects of the *second* examination are Anatomy, Physiology, Dental Anatomy and Histology.

The subjects of the *third* examination are Pathology and Bacteriology, Dental Materia Medica and Therapeutics, and Practical Dental Mechanics.

The subjects of the *final* examination are Medicine, Surgery, Dental Surgery and Pathology, and Orthodontia and Operative Dental Surgery. In this subject knowledge of a much higher standard, and more advanced practical work, will be required than for the Licence in Dental Surgery.

(*b*) For candidates possessing a Licence in Dental Surgery of a British University. Candidates must study for at least one year in the University. During such year they must (*a*) attend a course of instruction in Pathology and Bacteriology, and (*b*) spend at least six months in the Newcastle-upon-Tyne Dental Hospital in the study and practice of the higher branches of dental science. They must also pass the third and final examinations for the degree of Bachelor of Dental Surgery.

Degree of Master of Dental Surgery (*M.D.S.*).—Every candidate for this degree must be a Bachelor of Dental Surgery of the University of not less than two years' standing, and present an essay embodying original work and research in some subject connected with dentistry. They must also perform to the satisfaction of the examiners a piece of special dental work demanding a high degree of skill and experience.

The examinations are held concurrently with the medical examinations, and the fees payable by candidates for the Licence in Dental Surgery are as follows: First Examination, £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £3 10*s.*; Final Examination, £3 10*s.*; fee for Licence, £3; total, £15. For re-examination: First Examination, £1 10*s.*; Second Examination, £2; Third Examination, £2 (in one part only, £1); Fourth Examination, £2. The practical examinations in dentistry are conducted at the Newcastle Dental Hospital.

[†] See previous page.

[‡] A student who has diligently attended an approved course of Elementary Biology in a secondary school or other teaching institution recognised by the University may be admitted to a Professional Examination in Elementary Biology immediately after his registration as a dental student.

University of Leeds.—The degrees in Dental Surgery are Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.). All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the Matriculation Examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the University subsequently to the date of passing Parts I. and II. of the First Examination, and to have completed such period of pupilage or hospital attendance, or both, as may be prescribed by the regulations of the University. No candidate will be admitted to the degree who has not attained the age of 21 years on the day of graduation. The Diploma in Dental Surgery (L.D.S.) is awarded to successful candidates after attendance on approved courses extending over not less than four years. The curriculum for the Diploma now includes the study of Biology for the First Examination. The classes in the Department of Dentistry begin on Oct. 1st. The instruction in the Preliminary subjects of Chemistry, Physics, and Biology are given in the main buildings of the University. The classes in the other subjects and the systematic courses in Dental subjects are held in the School of Medicine of the University in Thoresby-place. The clinical instruction is given in the Dental Hospital at the Leeds General Infirmary. Applications for the prospectus should be made to the Academical Sub-Dean of the Faculty of Medicine.

University of Liverpool.—The University grants a Licence in Dental Surgery (L.D.S.) and degrees in Dental Surgery (B.D.S. and M.D.S.). The management of the curriculum (lectures, practical and clinical) is in the hands of the University Board of Dental Studies. The courses of systematic instruction are given in the main University buildings, and those in Dental Mechanics, Operative Dental Surgery, &c., are given in the University School Extension (opened 1922), adjoining the Dental Hospital, the laboratory of which is in charge of a skilled dental mechanic under the supervision of the Director of Dental Education. The clinical instruction is given in the Dental Hospital. Students can take the whole curriculum, including Dental Mechanics, at the University School of Dental Surgery. The times of the lectures at the University are arranged to meet the convenience of students, thus allowing the maximum time for attendance upon Dental Hospital practice. Fees: The fees for the complete courses, including Pupilage and Hospital Practice, are as follows: Degree of B.D.S., £250; M.D.S. (by research, £32; by examination, £27); L.D.S. (Liverpool), £198. Further information may be had from the Director of Dental Education, Prof. W. H. Gilmour.

In order to be admitted to the Bachelor's Degree in Dental Surgery a student must normally, after registration as an Internal Student, have—(1) Attended prescribed courses of study for five years at one or more Schools of the University. (2) Passed the following examinations:—(*a*) First Examination: *Part A*: (i.) Chemistry. (ii.) Physics, (iii.) Biology (Zoology and Botany); *Part B*: (iv.) Dental Metallurgy. Candidates may take Parts A and B separately. (*b*) Second Examination: *Part A* (i.) Anatomy, (ii.) Dental Anatomy, Dental Physiology, and Dental Histology; *Part B*: (iii.) Physiology; *Part C*: (iv.) Dental Mechanics. Candidates may take Part A separately but must take Parts B and C together. Third Examination: *Part A*: (i.) Elementary Bacteriology, (ii.) Clinical Chemistry, (iii.) General Pathology; *Part B*: (iv.) Dental Materia Medica, (v.) Dental Mechanics and Dental Prosthetics. Candidates may take Parts A and B separately. Students who have received not less than two years' instruction in Dental Mechanics previous to Nov. 30th, 1922, with a Dentist registered under the provisions of the Dentists Act (1921) and who have passed a recognised examination in preliminary education may, on application, be registered as students for the Licence under certain conditions.

University of London.—The curriculum for the degree of Bachelor of Dental Surgery covers five years from Matriculation. The Regulations for Internal and External Students may be obtained post-free on application to the Principal Officer, at the University.

University of Manchester.—In the University of Manchester the Dental Department forms an integral part of the Faculty of Medicine. This contains a series of laboratories, lecture rooms, and museums which will bear comparison with those of any other school in the kingdom, and the fullest opportunities for study are offered to students preparing for any of the professional examinations. Instruction adapted to the requirements of students preparing for the B.D.S. Degree and the Dental Diplomas of the University, the Royal College of Surgeons of England, and of other licensing bodies is given throughout the session both at the University and at the Dental Hospital of Manchester adjoining the University. The required general hospital practice is taken at the Manchester Royal Infirmary. Women students are admitted to the classes in the Dental Department, and for them common rooms are provided. The composition fee for candidates for the University degree of Bachelor of Dental Surgery is 93 guineas, payable in three equal yearly instalments. The composition fee for candidates for the University Diploma in Dentistry is 83 guineas, payable in three equal yearly instalments. The composition fee for candidates for the L.D.S. of England is 93 guineas, payable in three equal yearly instalments. Students who have already served their apprenticeship with a private practitioner, and who propose to complete the final portion of their attendance at the University and at an approved dental hospital, will be required to pay the composition fee in two equal instalments at the commencement of the first and second years of studentship. The composition fee does not include the hospital fees, the examination fees, nor the fee for the conferment of the degree or the diploma.

University of Sheffield.—*Degree of Bachelor of Dental Surgery.*—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequent to matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year after matriculation and the passing of the further examination in Chemistry and Physics. Second Examination: The subjects of the examination are Anatomy, Physiology, Dental Anatomy, Physiology and Histology; Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are: Part I., Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including Materia Medica and Therapeutics. Candidates for Part II. must have completed five and a half years of professional study.

Degree of Master of Dental Surgery.—Candidates must have passed the examination for the degree of B.D.S. at least one year previously and before admission to the examination must have held for not less than six months a dental appointment in a hospital affording full opportunity for the study of Dental Surgery. Candidates shall not be required to but may present a thesis embodying observations in some subject approved by the Faculty and a candidate whose thesis is of exceptional merit may be exempted from any part of the examination.

Diploma of Licentiate in Dental Surgery.—A candidate must have attained the age of 21 years on the day upon which he is to receive the diploma, and have pursued the courses of study required by the

Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall have passed an entrance examination satisfactory to the University before being admitted to any professional examination; the curriculum extends over four years from the date of passing a preliminary science examination in Chemistry and Physics. A three years' pupilage in Mechanical Dentistry is required† and four examinations must be passed, the subjects of which agree with those of the B.D.S. Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

University of Durham.—Every Dental student must, at the commencement of his studentship, be registered in the manner and under the conditions prescribed for Medical students.

First Examination for the Licence in Dental Surgery: This examination consists of two parts, which may be passed separately. Part 1, Biology, Organic Chemistry. Part 2, Theoretical Dental Mechanics, Dental Metallurgy (theoretical and practical). Second Examination: Anatomy, Physiology (including Biochemistry and Biophysics), Dental Anatomy and Dental Histology. Third Examination: Pathology and Bacteriology, Practical Dental Mechanics, Dental Materia Medica and Therapeutics. Final Examination: Medicine, Surgery, Dental Surgery and Pathology, Orthodontics, Operative Dental Surgery, and Dental Prosthetics, and Anæsthetics.

A candidate before presenting himself for examination is required to furnish certificates of instruction in the following subjects, attended after registration as a dental student at recognised Colleges or Schools: (*a*) Organic Chemistry; (*b*) Elementary Biology‡; (*c*) Human Anatomy, with dissections and demonstrations for three academic terms; (*d*) Physiology, including Biochemistry and Biophysics (with laboratory instruction, including practical Histology) for three academic terms; (*e*) General Pathology (including Bacteriology) for two academic terms; (*f*) Medicine for two academic terms; (*g*) Surgery for two academic terms; (*h*) the practice of a recognised General Hospital or Hospitals of not less than 80 beds, with certified instruction in Clinical Medicine and Clinical Surgery, for four academic terms. The certificates of teaching at General Hospitals must furnish evidence of the student having acted as Medical Clinical Clerk and Surgical Dresser, and of attendance in the Out-patient or Casualty Departments. A certificate of clinical instruction in Venereal Disease is required.

The candidate must have attended at a recognised Dental School courses of instruction in the following special subjects: (*a*) Dental Anatomy and Physiology, human and comparative. The course should comprise a minimum of 20 meetings of the class. (*b*) Practical Dental Histology and Morbid Histology. The course should comprise a minimum of 16 meetings of the class. (*c*) Dental Pathology and Surgery. The course should comprise a minimum of 20 meetings of the class. (*d*) Dental Materia Medica and Therapeutics. The course should comprise a minimum of 16 meetings of the class. (*e*) Dental Metallurgy (with practical work and demonstrations). The course should comprise a minimum of 20 meetings of the class. (*f*) Dental Mechanics (with practical work and demonstrations). The course should comprise a minimum of 20 meetings and 20 demonstrations. (*g*) A course of instruction in the use of Anæsthetics, general and local, employed in Dental Practice. (*h*) A course of instruction in Radiology as applied to Dentistry.

Note.—A candidate must produce a certificate of having administered general anæsthetics on at least ten occasions.

The candidate must have for at least 24 calendar months attended, during the ordinary academic terms, the practice of a recognised Dental Hospital or of the recognised Dental Department of a General Hospital, and have received for not less than 24 calendar months practical instruction in Dental Mechanics.

Note.—No portion of such practical instruction which is taken prior to the date of registration shall be reckoned as a portion of the four years of Professional Study required.

Instruction in Dental Mechanics should, if possible, be taken at a recognised Dental Hospital and School. If any part of such instruction be taken by the candidate as a pupil with a registered dentist the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a Dental Hospital and School.

Degree of Bachelor of Dental Surgery (*B.D.S.*).—(*a*) For students taking their complete course of instruction in the University. Such students must pass the same matriculation tests as medical students, and the same pre-registration examination in Inorganic Chemistry and Physics. After registration students must spend five years in the University, on attendance on such subjects as Senate, on the recommendation of the Board of the Faculty of Medicine, may from time to time determine. They must attend the practice of the Newcastle-upon-Tyne Dental Hospital for not less than two and a half years. Six months of this time must be devoted to the study of the higher branches of dental science. There are four examinations.

The subjects of the *first* examination are Biology and Organic Chemistry, of the same standard as for medical students; and Dental Mechanics and Metallurgy.

The subjects of the *second* examination are Anatomy, Physiology, Dental Anatomy and Histology.

The subjects of the *third* examination are Pathology and Bacteriology, Dental Materia Medica and Therapeutics, and Practical Dental Mechanics.

The subjects of the *final* examination are Medicine, Surgery, Dental Surgery and Pathology, and Orthodontia and Operative Dental Surgery. In this subject knowledge of a much higher standard, and more advanced practical work, will be required than for the Licence in Dental Surgery.

(*b*) For candidates possessing a Licence in Dental Surgery of a British University. Candidates must study for at least one year in the University. During such year they must (*a*) attend a course of instruction in Pathology and Bacteriology, and (*b*) spend at least six months in the Newcastle-upon-Tyne Dental Hospital in the study and practice of the higher branches of dental science. They must also pass the third and final examinations for the degree of Bachelor of Dental Surgery.

Degree of Master of Dental Surgery (*M.D.S.*)—Every candidate for this degree must be a Bachelor of Dental Surgery of the University of not less than two years' standing, and present an essay embodying original work and research in some subject connected with dentistry. They must also perform to the satisfaction of the examiners a piece of special dental work demanding a high degree of skill and experience.

The examinations are held concurrently with the medical examinations, and the fees payable by candidates for the Licence in Dental Surgery are as follows: First Examination, £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £3 10*s.*; Final Examination, £3 10*s.*; fee for Licence, £3; total, £15. For re-examination: First Examination, £1 10*s.*; Second Examination, £2; Third Examination, £2 (in one part only, £1); Fourth Examination, £2. The practical examinations in dentistry are conducted at the Newcastle Dental Hospital.

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† See previous page.

‡ A student who has diligently attended an approved course of Elementary Biology in a secondary school or other teaching institution recognised by the University may be admitted to a Professional Examination in Elementary Biology immediately after his registration as a dental student.

It has a floor space of over 6000 square feet, and affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in July of each year, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

Appointments: All appointments are made according to the merits of the candidates, as determined by a committee of the Dental Staff. Eighteen house surgeons, 15 assistant house surgeons, and 15 clinical assistants, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, orthodontia dresser, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and ordinary extraction rooms, and probationary dresser.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Métallurgy and Dental Prosthesis. The extension of the school will be undertaken during the ensuing session. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4s. 6d., or including Mechanical Pupilage, £255 15s. 9d., inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15s.; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5s., payable in two instalments of £13 2s. 6d. each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11s. 3d., which may be paid in two annual instalments of £65 12s. 6d. and £45 18s. 9d. respectively; mechanical pupils may join for a probationary period of one month, fee £6 11s. 3d., which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2s. 6d. One Entrance Scholarship is offered annually of the value of £37 10s. It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. The School forms a part of the Leeds School of Medicine, whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital at the General

University regulations during a period of not less than four years subsequently to passing the preliminary examination and the passing of the further examination in Chemistry and Physics. Two years must be passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year. Second Examination: The subjects of the examination are Anatomy and Physiology, Dental Anatomy and Physiology, Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are: Part I., Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including Materia Medica and Therapeutics. Candidates for Part II. must have completed the fourth year of professional study.

The Dental Composition Fee is £25 for each year of the course. In addition a fee of £50 is payable each year the student receives instruction in Mechanical Dentistry in the Dental Department.

National University of Ireland.*—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously; (*b*) shall have pursued an approved course of study in the Faculty of Medicine; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

Queen's University of Belfast.—The following degrees and diplomas are now conferred: Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

TEACHING INSTITUTIONS IN DENTISTRY.

Of teaching institutions those connected with the several universities have now been described in some detail, but in addition to these there are a number of institutions which offer facilities to dental students and which are here set out under their localities.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London, and women are now admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s.* in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £68 5*s.* Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s.* The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. *Composition Fees*: Comprising two years' Dental Mechanics, Anatomy, Physiology; two years' Hospital Practice, Medicine, Surgery, and Dental Lectures (four years): 1st year, £56; 2nd year, £84; 3rd year, £64; 4th year, £32; total, £236. Medical Men: Two years' Mechanics, and Dental Practice and Lectures: 1st year, £102 6*s.*; 2nd year, £70; total, £172 6*s.* For a six years' course of medical and dental education comprising the whole of the dental curriculum and the curriculum for the M.R.C.S., L.R.C.P. diplomas: 1st year, £91; 2nd year, £70; 3rd year, £73; 4th year, £60; 5th year, £73; 6th year, £49; total, £416. in six instalments payable in advance.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers The Conservation Room is open from 9 A.M. till 5 P.M.

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* No returns.

It has a floor space of over 6000 square feet, and affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in July of each year, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

Appointments: All appointments are made according to the merits of the candidates, as determined by a committee of the Dental Staff. Eighteen house surgeons, 15 assistant house surgeons, and 15 clinical assistants, and four student demonstrators of Dental Histology are appointed annually. The following appointments are held by students: Full surgeon's dresser, assistant surgeon's dresser, orthodontia dresser, casualty dresser, clerk to the anæsthetist, dresser in the gas extraction and ordinary extraction rooms, and probationary dresser.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Metallurgy and Dental Prosthesis. The extension of the school will be undertaken during the ensuing session. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to Scholarships and Prizes, fees and course of study advised, apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4*s.* 6*d.*, or including Mechanical Pupilage, £255 15*s.* 9*d.*, inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15*s.*; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5*s.*, payable in two instalments of £13 2*s.* 6*d.* each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11*s.* 3*d.*, which may be paid in two annual instalments of £65 12*s.* 6*d.* and £45 18*s.* 9*d.* respectively; mechanical pupils may join for a probationary period of one month, fee £6 11*s.* 3*d.*, which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2*s.* 6*d.* One Entrance Scholarship is offered annually of the value of £37 10*s.* It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

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University regulations during a period of not less than four years subsequently to passing the preliminary examination and the passing of the further examination in Chemistry and Physics. Two years must be passed in the University, one at least being subsequent to the passing of the First Examination.

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The Dental Composition Fee is £25 for each year of the course. In addition a fee of £50 is payable each year the student receives instruction in Mechanical Dentistry in the Dental Department.

NATIONAL UNIVERSITY OF IRELAND.*—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously; (*b*) shall have pursued an approved course of study in the Faculty of Medicine; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

QUEEN'S UNIVERSITY OF BELFAST.—The following degrees and diplomas are now conferred: Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

TEACHING INSTITUTIONS IN DENTISTRY.

Of teaching institutions those connected with the several universities have now been described in some detail, but in addition to these there are a number of institutions which offer facilities to dental students and which are here set out under their localities.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London, and women are now admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s*. in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £68 5*s*. Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s*. The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Anatomy and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. Composition Fees: Comprising two years' *Dental* Mechanics, Anatomy, Physiology; two years' Hospital Practice, Medicine, Surgery, and Dental Lectures (four years): 1st year, £56; 2nd year, £84; 3rd year, £64; 4th year, £32; total, £236. Medical Men: Two years' Mechanics. and Dental Practice and Lectures: 1st year, £102 6*s*.; 2nd year, £70; total, £172 6*s*. For a six years' course of medical and dental education comprising the whole of the dental curriculum and the curriculum for the M.R.C.S., L.R.C.P. diplomas: 1st year, £91; 2nd year, £70; 3rd year, £73; 4th year, £60; 5th year, £73; 6th year, £49; total, £416. in six instalments payable in advance.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers The Conservation Room is open from 9 A.M. till 5 P.M.

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* No returns.

Reviews and Notices of Books.

DISEASES OF MIDDLE LIFE.

The Prevention, Recognition, and Treatment of the Morbid Processes of Special Significance in this Critical Life Period. Comprising 22 original articles by various eminent authorities. Edited by FRANK A. CRAIG, M.D., Associate Director of the Clinical and Sociological Department of the Henry Phipps Institute of the University of Pennsylvania. Philadelphia: F. A. Davis Company. In two volumes. Pp. 1871. $15.

ATTENTION is more and more being directed to the early stage of many diseases and to the best means of preventing their more serious development. We are often reminded that middle life is the danger period for a great variety of functional and organic breakdowns. The aim of the monographs in these two readable volumes is to assist the practitioner to detect and to treat the early departures from health in middle life.

It is difficult to deal comprehensively with the therapeutic problems involved. There is, for example, the systematic treatment of incipient and chronic disease at health resorts and spas, a large section of the habitual visitors being middle-aged invalids. To this branch of therapeutics only occasional reference is made in these volumes. We select a few examples of the broad and helpful spirit in which the more important sections are discussed. Diet is excellently dealt with by Dr. C. B. Farr, of Akron, Ohio. He calls attention to the diet-requirements in middle life, and refers to the plus or minus basal metabolism of some middle-age disorders, and to the small demand for extra calories in some occupations, such as 44 for a physician or tailor, as against 378 for a man sawing wood. The view of this authority that there is little real proof of intestinal auto-intoxication is supported by another writer in this work, but contradicted by a third. There is a timely and suggestive account of the liabilities and dangers of hypernutrition and of subnutrition. In the section on occupation, Prof. E. R. Hayhurst (Ohio State University) asserts the principle that producers become dependents only by mishap, and that debility-dependence ought not to begin until well over 60. He points out that convalescence can be much expedited by graduated activity of a kind interesting to the patient. The normal temperature for work-rooms, 68° F. for sedentary occupations and downwards, is higher than that prescribed by English authorities, but the prime importance of adequate cooling of the body is not disputed. Prof. J. E. Talley (University of Pennsylvania) gives a more favourable prognosis for disease of the heart in middle life than was current a few years ago. For example, he states that extra-systoles in the third and fourth decades, from which many medical men suffer, usually disappear, or anyhow diminish, in the fifth decade, if the digestion is attended to. Paroxysmal tachycardia coming on in middle life is not so very serious; and cases of auricular flutter, associated with arteriosclerosis, in later life often do fairly well. Again, auricular fibrillation may go on for years, the prognosis depending on the reaction to digitalis. Quinidine, in the author's experience, abolishes fibrillation in 50 per cent. of the cases. He accepts the general view that the prognosis of valvular disease depends on the condition of the myocardium. The value of spirometer measurements in the prognosis of heart affections is emphasised. As showing the prevalence of these affections, it is stated that there are 34 special cardiac clinics in New York, and need for more convalescent beds for "potential cardiac" cases.

Prof. G. M. Piersol (Pennsylvania University) gives an admirable account of the progressive symptomatology of hypertension, following Osler, Adami, Janeway, and others in considering this common disturbance of middle age as antecedent to sclerosis and due to habitual arteriolar spasm. Arteriolar spasm, increased peripheral resistance, increased arterial pressure, hypertrophy of the left ventricle, and myocardial failure form an obvious morbid sequence. The author seems to adopt the view that this "compensation" is conservative, and essential to maintain the circulation. On the other hand, it might be claimed that, if the chain of causation is correctly stated, any method of treatment, such as venesection or warm bathing, that relieves peripheral spasm, will be more truly conservative. Dr. O. H. P. Pepper, in a valuable article on Diseases of the Kidney, remarks that, whilst insurance statistics show that the albuminuria of adolescents does not lead to nephritis in later years, the albuminuria which develops in middle life is a sure sign of kidney disease. When the excretory renal function is reduced, as in middle life, its estimation becomes a matter of importance. The author discusses the signs and symptoms of renal insufficiency and the tests by which it may be detected, concluding that the response of the kidney to water, in minimal or excess quantities, affords a better criterion in chronic nephritis than phenol-sulphonephthalein. These two methods, with the determination of the blood-urea nitrogen, are the three tests of renal function most useful in middle age. Chronic nephritis without œdema is, in the writer's belief, increasing in frequency in middle age. Diabetes mellitus, according to Dr. H. K. Mohler, is becoming more common in America. He claims that Allen's principles of diet have prolonged the life of the adult diabetic by three years. A short section on insulin was added after the book was written.

In a section on Diseases of the Respiratory Tract, the editor expresses an interesting warning. Forced breathing, he thinks, may activate an incipient or dormant tuberculosis, and there is no advantage in increasing the air capacity of healthy lungs excepting in cases of faulty development or improper breathing, or for special requirements like singing or running. Again, in middle-aged persons with fibrous tuberculosis fresh air may cause dangerous chilling, but with care the majority of such cases will be able to "play a minor part in workaday life," although only a few can follow "the abnormal life of the average individual." Dr. Chandler Walker (Harvard Medical School), dealing with bronchial asthma, claims better results from protein therapy than are usually claimed in this country. As to "colds," he considers that they invariably signify lowered physical resistance, too many nasal operations are performed in America, and too much mucous membrane removed. Autogenous vaccines are praised.

In writing on the Gastric Disturbances of Middle Life, Prof. Julius Friedenwald and Dr. T. H. Morrison (both of the University of Maryland) throw out many arresting suggestions not all of which will be accepted. In their experience gastric neuroses form more than half the stomach cases. These are commonest in middle life, often occur in robust subjects, and are sometimes unexpectedly sudden in their onset, like cancer. The old observation of Hutchinson is confirmed, that secondary gastric symptoms are present in the great majority (80 per cent.) of early cases of pulmonary tuberculosis. The progressive sclerotic degeneration of the secretory structure, first demonstrated by Fenwick, probably accounts for the diminution of motility and secretion and frequent dyspepsia in later life, and the achylia gastrica of many elderly persons. Dr. Anthony Basler (Christ's, N.J.), from his experience of chronic intestinal cases, regards the colon as the chief cause of disease in middle life, but is strongly opposed to surgical intervention, regarding operation upon the colon as unwarrantable unless bona fide obstruction is present. He makes an exception for chronic colitis with follicular ulceration, in which appendicostomy and trans-irrigation of the large bowel give, at least for a time, good results. Much of the current treatment of colon disorders is, in his view, based on rash assumptions from laboratory findings. "The germicidal effect of drugs in the

Infirmary. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery and prosthetic dentistry, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia and Dental Radiography. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, The University, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5*s.*, paid in instalments. For the two years' Operative Course only, £26 5*s.*, paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. Additional practice in Dental Mechanics may be taken by pupils who have already received their mechanical training elsewhere, at a fee of £36 15*s.* for six months. All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £60 4*s.* if paid in one sum, or £62 6*s.* if paid in two instalments of £31 3*s.* The Composition Fee for the Lectures at the Colleges of Medicine and Science is £57 10*s.*; in addition to this there is a library and an athletic fee. The fee for General Hospital Practice at the Royal Victoria Infirmary, Newcastle-upon-Tyne, is £23 2*s.* Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £118 16*s.* Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence in Dental Surgery amounts to £197 3*s.* 6*d.* The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Pathology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, and Anæsthetics. A new Radiography department has been added. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £50 on entry, or in two instalments of £31 10*s.* and £21. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Fee for two years' tuition, £63, or in two instalments. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry with Metallurgy, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. Fees: Hospital Practice (each year), £18 18*s.*; Lectures, £5 5*s.* The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

Reviews and Notices of Books.

DISEASES OF MIDDLE LIFE.

The Prevention, Recognition, and Treatment of the Morbid Processes of Special Significance in this Critical Life Period. Comprising 22 original articles by various eminent authorities. Edited by FRANK A. CRAIG, M.D., Associate Director of the Clinical and Sociological Department of the Henry Phipps Institute of the University of Pennsylvania. Philadelphia: F. A. Davis Company. In two volumes. Pp. 1871. $15.

ATTENTION is more and more being directed to the early stage of many diseases and to the best means of preventing their more serious development. We are often reminded that middle life is the danger period for a great variety of functional and organic breakdowns. The aim of the monographs in these two readable volumes is to assist the practitioner to detect and to treat the early departures from health in middle life.

It is difficult to deal comprehensively with the therapeutic problems involved. There is, for example, the systematic treatment of incipient and chronic disease at health resorts and spas, a large section of the habitual visitors being middle-aged invalids. To this branch of therapeutics only occasional reference is made in these volumes. We select a few examples of the broad and helpful spirit in which the more important sections are discussed. Diet is excellently dealt with by Dr. C. B. Farr, of Akron, Ohio. He calls attention to the diet-requirements in middle life, and refers to the plus or minus basal metabolism of some middle-age disorders, and to the small demand for extra calories in some occupations, such as 44 for a physician or tailor, as against 378 for a man sawing wood. The view of this authority that there is little real proof of intestinal auto-intoxication is supported by another writer in this work, but contradicted by a third. There is a timely and suggestive account of the liabilities and dangers of hypernutrition and of subnutrition. In the section on occupation, Prof. E. R. Hayhurst (Ohio State University) asserts the principle that producers become dependents only by mishap, and that debility-dependence ought not to begin until well over 60. He points out that convalescence can be much expedited by graduated activity of a kind interesting to the patient. The normal temperature for work-rooms, 68° F. for sedentary occupations and downwards, is higher than that prescribed by English authorities, but the prime importance of adequate cooling of the body is not disputed. Prof. J. E. Talley (University of Pennsylvania) gives a more favourable prognosis for disease of the heart in middle life than was current a few years ago. For example, he states that extra-systoles in the third and fourth decades, from which many medical men suffer, usually disappear, or anyhow diminish, in the fifth decade, if the digestion is attended to. Paroxysmal tachycardia coming on in middle life is not so very serious; and cases of auricular flutter, associated with arteriosclerosis, in later life often do fairly well. Again, auricular fibrillation may go on for years, the prognosis depending on the reaction to digitalis. Quinidine, in the author's experience, abolishes fibrillation in 50 per cent. of the cases. He accepts the general view that the prognosis of valvular disease depends on the condition of the myocardium. The value of spirometer measurements in the prognosis of heart affections is emphasised. As showing the prevalence of these affections, it is stated that there are 34 special cardiac clinics in New York, and need for more convalescent beds for "potential cardiac" cases.

Prof. G. M. Piersol (Pennsylvania University) gives an admirable account of the progressive symptomatology of hypertension, following Osler, Adami, Janeway, and others in considering this common disturbance of middle age as antecedent to sclerosis and due to habitual arteriolar spasm. Arteriolar spasm, increased peripheral resistance, increased arterial pressure, hypertrophy of the left ventricle, and myocardial failure form an obvious morbid sequence. The author seems to adopt the view that this "compensation" is conservative, and essential to maintain the circulation. On the other hand, it might be claimed that, if the chain of causation is correctly stated, any method of treatment, such as venesection or warm bathing, that relieves peripheral spasm, will be more truly conservative. Dr. O. H. P. Pepper, in a valuable article on Diseases of the Kidney, remarks that, whilst insurance statistics show that the albuminuria of adolescents does not lead to nephritis in later years, the albuminuria which develops in middle life is a sure sign of kidney disease. When the excretory renal function is reduced, as in middle life, its estimation becomes a matter of importance. The author discusses the signs and symptoms of renal insufficiency and the tests by which it may be detected, concluding that the response of the kidney to water, in minimal or excess quantities, affords a better criterion in chronic nephritis than phenol-sulphonephthalein. These two methods, with the determination of the blood-urea nitrogen, are the three tests of renal function most useful in middle age. Chronic nephritis without œdema is, in the writer's belief, increasing in frequency in middle age. Diabetes mellitus, according to Dr. H. K. Mohler, is becoming more common in America. He claims that Allen's principles of diet have prolonged the life of the adult diabetic by three years. A short section on insulin was added after the book was written.

In a section on Diseases of the Respiratory Tract, the editor expresses an interesting warning. Forced breathing, he thinks, may activate an incipient or dormant tuberculosis, and there is no advantage in increasing the air capacity of healthy lungs excepting in cases of faulty development or improper breathing, or for special requirements like singing or running. Again, in middle-aged persons with fibrous tuberculosis fresh air may cause dangerous chilling, but with care the majority of such cases will be able to "play a minor part in workaday life," although only a few can follow "the abnormal life of the average individual." Dr. Chandler Walker (Harvard Medical School), dealing with bronchial asthma, claims better results from protein therapy than are usually claimed in this country. As to "colds," he considers that they invariably signify lowered physical resistance, too many nasal operations are performed in America, and too much mucous membrane removed. Autogenous vaccines are praised.

In writing on the Gastric Disturbances of Middle Life, Prof. Julius Friedenwald and Dr. T. H. Morrison (both of the University of Maryland) throw out many arresting suggestions not all of which will be accepted. In their experience gastric neuroses form more than half the stomach cases. These are commonest in middle life, often occur in robust subjects, and are sometimes unexpectedly sudden in their onset, like cancer. The old observation of Hutchinson is confirmed, that secondary gastric symptoms are present in the great majority (80 per cent.) of early cases of pulmonary tuberculosis. The progressive sclerotic degeneration of the secretory structure, first demonstrated by Fenwick, probably accounts for the diminution of motility and secretion and frequent dyspepsia in later life, and the achylia gastrica of many elderly persons. Dr. Anthony Basler (Christ's, N.J.), from his experience of chronic intestinal cases, regards the colon as the chief cause of disease in middle life, but is strongly opposed to surgical intervention, regarding operation upon the colon as unwarrantable unless bona fide obstruction is present. He makes an exception for chronic colitis with follicular ulceration, in which appendicostomy and trans-irrigation of the large bowel give, at least for a time, good results. Much of the current treatment of colon disorders is, in his view, based on rash assumptions from laboratory findings. "The germicidal effect of drugs in the intestinal canal is an ostrich proposition," and the claims made for colonic lavage are, in his opinion, unjustified. The metabolic disturbances of infective arthritis are described by Prof. J. A. Lichty (University of Pittsburgh) as operating, like traumatism, to furnish a prepared ground for infective processes. The hypothesis agrees well with the conception of a complex causation for these diseases, and indeed for all disease. Lichty ranges himself with those who deny that the alimentary canal is a common source of infection. Excepting in the case of gonorrhœal arthritis, the use of vaccines has little or no scientific basis. Baths and waters are advocated, the excessive use of heat and undue local reactions being avoided.

The book abounds in fresh and practical observations, and will be of interest to all practitioners who are in touch with the problems of health in middle life. The bibliographies following many of the sections give it an added value. A duplication of paragraphs in one of the articles in the second volume will, no doubt, be corrected in a second edition.

COLLECTED PAPERS.

London School of Tropical Medicine: Department of Helminthology. Collected Papers. Part 5. 1924. Nos. L.–LXVI.

THIS collection of 17 scientific papers, the fifth volume of the series to be issued within the last two years, serves as an index of the activities of the Helminthological Department of the London School of Tropical Medicine, under the directorship of Prof. R. T. Leiper. The volume includes a paper by H. H. Scott on an experimental study of the life-histories of *Hymenolepis fraterna*, Stiles, 1906, and *Hymenolepis longior*, Baylis, 1922, in the mouse, and a number of studies on nematodes of veterinary interest by T. W. M. Cameron and T. Goodey. M. Khalil writes upon the morphology of *Schistosoma bovis*, and Prof. R. T. Leiper contributes an address on the Present-day Teachings on Helminthology in Relation to Public Health.

OTO-RHINO-LARYNGOLOGY.

The Mechanism of the Cochlea: A Restatement of the Resonance Theory of Hearing. By GEORGE WILKINSON, M.B. Camb., F.R.C.S. Eng.; and ALBERT A. GRAY, M.D. Glasg., F.R.S.E. London: Macmillan and Co. 1924. Pp. 253. 12*s.* 6*d.*

THERE are two principal theories of the method whereby the perception of sound, especially of musical sounds, is translated into consciousness, which are called respectively the "resonance" and the "telephone" theories. The resonance theory was originally propounded by von Helmholtz in 1863, and supposes that sounds of different pitch stimulate different portions of the organ of Corti—that is, that sounds are analysed in the cochlea. The telephone theory, put forward in 1886 by Rutherford, premises that the basilar membrane follows the vibrations as a whole, and transmits them as received to the auditory centre in the brain, which performs the task of analysing compound tones and of distinguishing pitch. The resonance theory has remained the most generally accepted, but certain difficulties have prevented its acceptance as a complete explanation. The most important of these difficulties are that the fibres of the basilar membrane are bound together and cannot vibrate separately for tones of every different pitch, and that the differentiation as to length of the basilar fibres is quite inadequate to account for a tuning of these fibres for the whole range of 10 to 11 octaves comprised in the audible scale. The first objection has been met by Dr. Gray's theory of "maximum stimulation" on the analogy of a similar phenomenon in tactile sensation; when a point is pressed on to the skin it is still felt only as a point although, with firm pressure, many surrounding nerve-endings are affected, so, it is held, the nerve-impulses from neighbouring basilar fibres are repressed and only the vibration of the fibre at the maximum point of vibration affects consciousness. Mr. Wilkinson's theory of the fluid load on the fibres of the basilar membrane is designed to meet the second difficulty. The vibration period of a stretched string depends on three factors—length, tension, and mass per unit length, or load. The length and tension of the basilar fibres are known to be differentiated progressively, and Mr. Wilkinson's theory adds that the load on any fibre is the columns of endolymph between it and the fenestræ, and that this is sufficient to allow of a tuning of the fibres to the 10 or 11 octaves required. He has constructed a very ingenious model which gives results that, though necessarily rough, bear out his contention. A full description of this, and of the mathematical formulæ involved, will be found in this book, together with a complete account of the resonance theory, and a consideration of the telephone and other subsidiary theories.

The book deserves the attention of all interested in the subject.

Technique chirurgicale oto-rhino-laryngologique. Deuxième fascicule: Fosses nasales, naso-pharynx, cavités accessoires. By E. J. MOURE, Professor in the Faculty of Medicine of Bordeaux; G. LIÉBAULT, formerly Interne of the Hospitals of Paris; and G. CANUYT, Director of the Oto-Rhino-Laryngological Clinic of Strasbourg. Paris: Libraire Octave Doin. 1924. Pp. 527. Fr.55.

THE aim of this book is to describe in full detail the operative procedures required in the treatment of diseases of the nose, naso-pharynx, and nasal accessory sinuses, together with a more concise account of the indications, complications, and after-treatment of each operation. In this the authors have succeeded admirably, and the book is one which will be of interest and assistance to anyone about to undertake the operations described in it. Only one operative method is usually discussed at length in each case, although other procedures are often mentioned and arguments given for or against their adoption. Prof. Moure has such a great reputation that his opinions on such matters must command the respect and interest of laryngologists in this country. The lavish illustrations are a noteworthy feature of the book, especially the drawings by S. Dupret, which are mostly full-page and fully life-size, and which depict each stage of the major operations. The operation of lateral rhinotomy, especially associated here with the name of Prof. Moure, is very fully detailed and illustrated; indeed, it is described twice over in different chapters, and some 10 or 12 full-page illustrations are printed twice in almost identical form. Two variations of this method of obtaining access to the nasal passages are given, and Prof. Moure rightly insists that they are distinct operations; the first, called "ethmoidectomy," includes removal of the nasal process of the frontal bone and gives access to the roof of the nose and the sphenoidal region; while the trans-maxillo-nasal operation opens the antrum and also gives access to the nasopharynx.

Although the work deals largely with these and other major operations, minor procedures, such as cauterisation and the treatment of epistaxis, receive attention, and it is in such lesser matters especially that the methods recommended differ in some particulars from the practice in general vogue in England. Local anæsthesia is recommended for operations up to, and including, those of the magnitude of the Caldwell-Luc operation; and it is described, though not definitely preferred, for the frontal sinus operation and even for lateral rhinotomy. For the removal of adenoids no anæsthetic, local or general, is the rule; and the authors feel so strongly on this point that they say that "for some years a tendency has shown itself in favour of general anæsthesia with chloroform, and certain operators, following in this a bad foreign influence, have made a regular surgical intervention of the removal of adenoids." Other points of interest may be mentioned. Cauterisation of the inferior turbinals, to reduce hypertrophic swelling, is condemned, as the effect only lasts for a few months, and vibro-massage of the mucous membrane is preferred. Prof. Moure still removes septal spurs with his spoke-shave; and he does not consider a traumatic or irregular septal deviation suitable for submucous resection, but prefers to cut away the convexity with its muco-perichondrium, leaving only the mucosa on the concave side. For chronic antral suppuration he employs the Caldwell-Luc operation, and considers the intranasal route insufficient; he curettes away all the antral mucosa, sews up the gingival incision, and packs antrum and nose with a long strip of gauze which is only completely removed by the end of six or eight days. For frontal sinusitis he condemns both the intranasal operation and removal of the anterior wall, and claims that he has proved that the frontal sinus, thoroughly curetted, is obliterated during healing; he performs the Ogston-Luc operation and sutures the external wound completely, leaving a long strip of gauze in the sinus to be gradually removed through the nose.

Although certain of these methods will not meet with general approval, the book is a most valuable and instructive one.

Die Funktionsprüfung des Akustischen und Statischen Labyrinths. By Dr. MAXIMILIAN RAUCH, Assistant to the University Clinic for Diseases of the Ear, Nose, and Larynx. Vienna and Berlin: Julius Springer. 1924. Pp. 71. $0·60.

IN this little book Dr. Rauch has, at the request of his pupils, put together and expanded a series of articles on examination of the vestibular apparatus which he wrote in 1912. To this he has added a preliminary section on the functional testing of hearing, which provides an adequate description of all the usual tests. The examination of the static labyrinth is, however, a much more complicated matter, and it is extremely difficult for the student to memorise accurately the different directions of the nystagmus which results from stimulation of each semicircular canal by mechanical rotation and by caloric stimulation. The nystagmus is the direct result of movement of the endolymph in the canals, and consists in a slow component due to this movement and a rapid component due to cerebral correction; the fundamental rule, from which the direction of the nystagmus can be deduced, is that the slow movement of the eyes is in the same direction as the movement of the endolymph. Dr. Rauch has set out the methods of testing and the reactions in considerable detail, aided by photographs of a large-scale model of the membranous labyrinths, and with sufficient clarity to be of great help to those studying this intricate subject; it is unfortunate that, by a misprint, the right labyrinth is named the left, and vice versâ, in one of the illustrations.

BOOKS FOR NURSES.

Practical Nursing. Sixth edition. By H. E. CUFF, M.D., F.R.C.S., and W. T. GORDON PUGH, M.D., B.S. London: William Blackwood and Sons. 1924. Pp. 635. 10*s.* 6*d.*

Dr. Gordon Pugh has brought up to date a book already popular with the nursing profession, which in its original edition formed the foundation of much theoretical instruction in a great many of the leading training schools. The subjects dealt with in the latest edition cover the curriculum of training in nursing, hygiene, and dietetics required by the General Nursing Council, and the book supplies a comprehensive text-book for all nurses wishing to qualify for the State Register. The chapter on hygiene gives evidence of the growing demand that the trained nurse shall comprehend the underlying principles of public health, and that these principles should form part of her hospital training. Excellent chapters on fevers and fever nursing, the nursing and feeding of sick children, and diseases of the nervous system should prove helpful to nurses working in special hospitals who may wish to qualify for one or more of the supplementary parts of the State Register.

A Manual of Nursing Procedures. By E. PRISCILLA REID, R.N., MABEL HOFFMAN, R.N., HAZEL JENNINGS, R.N., and LILLIAN A. READ, R.N. London and Philadelphia: W. B. Saunders Company. 1924. Pp. 181. 8*s.* 6*d.*

THIS book sets out the nursing procedures in the American hospitals with which the authors are specially acquainted, and should prove of value to nurses trained at those schools and elsewhere. It should also prove useful to probationers preparing for examinations. The text is concise, and tabulated under headings which include the purposes, the required equipment, the method of procedure, and the necessary precautions of the carrying out of several nursing duties, the object of adopting this form being to save confusion, time, and energy. Excellent illustrations elucidate the text and emphasise correct nursing technique.

Belle Vue School of Nursing. By DOROTHY DIX HILL. New York: The Macmillan Company. Pp. 187.

Miss Hill has arranged concisely a tabulated list of recipes based on the nursing procedures adopted at Belle Vue School of Nursing, New York. The chapter on bandaging is undoubtedly the best contribution in the book, although one would question the advisability of pupil nurses being taught to fasten a bandage with a " pin " as an alternative to fastening it with a safety-pin. The book may prove of value to the pupil nurses at Belle Vue, but as the underlying principles of nursing are only dealt with in a very limited sense it cannot be considered a substantial addition to nursing literature.

Maternity Nursing in a Nutshell. By ELIZABETH H. WICKHAM, R.N., Former Supervisor of the Maternity Department, Lebanon Hospital, N.Y. Philadelphia: F. A. Davis and Co. 1924. Pp. 167. $1·50.

THIS little manual will probably be of service to graduate nurses in America who are not midwives and have only a limited knowledge of maternity nursing. The British nurse may be interested in it as illustrating American methods, but as most of them who do maternity nursing are midwives they will find the book too slight and sketchy to be of service. In dealing with the emergency treatment of post-partum hæmorrhage, Miss Wickham gives the usual measures—massage, ergot, posture, hot vaginal douche (124° Fahr.!), but adds that if these fail the nurse should "as speedily as possible proceed to pack the uterus." This is a difficult operation at any time, and certainly not one to be adopted by a nurse. No mention is made of bi-manual compression or intramuscular injections of pituitary extract. Miss Wickham gives her views on "twilight sleep," but omits to lay stress on points to be observed by the nurse in such cases. Shell-fish is advised when breast milk is deficient; the author believes that such food increases the supply of milk when all other foods fail. There are a glossary, appendix, index, and a good supply of illustrations to this little book.

NOUVEAU TRAITÉ DE MÉDECINE.

Edited by G. H. ROGER, F. WIDAL, and P. G. TEISSIER. Vol. VIII.: Pathologie des glandes endocrines; troubles du développement. Paris: Masson et Cie. Pp. 455. Fr.40.

WE have previously had occasion to remark on the excellence of this system of medicine. The present volume maintains, in many respects, the high standard of its predecessors. The articles on diseases of the pituitary and thyroid glands, especially those by G. A. Sézary and A. Souques, are models of precise reasoning, and the numerous illustrations with which the whole volume is embellished form a clinical collection of great interest. The section on the pathology of the suprarenal glands is marred by the over-emphasis laid on the supposed syndrome of hyperfunction of those organs. Without questioning the possible occurrence of this syndrome on the existing evidence, there are no grounds for dogmatic statement, and this article departs from that spirit of critical examination which should be present always in systematic medicine.

Reports and Analytical Records.

"TABLOID" PARATHYROID.

(Burroughs, Wellcome and Co., Snow Hill Buildings, London, E.C. 1.)

Tabloids prepared from pure gland substance enable the clinician to make use of the action of parathyroid in regulating the calcium metabolism of the body. The use of parathyroid in many and diverse pathological conditions is now well supported by medical evidence, and this preparation has been made by trained workers and has undergone close inspection to ensure the genuineness of the product. Each "tabloid" product represents two-fifths of a grain of fresh gland, equivalent to one-tenth of a grain of desiccated gland substance. "Tabloid" Parathyroid Gland is issued in bottles of 25.

"OSMO" KAOLIN (MORSON).

(Allen and Hanburys, Ltd., Plough-court, Lombard-street, London, E.C. 3.)

Kaolin, or aluminium silicate, has proved useful in medicine mainly because of its important quality of adsorption, but it is, of course, necessary that its purity should be unquestioned. "Osmo" Kaolin (Morson) is a pure colloidal preparation presenting kaolin in an exceedingly fine state of subdivision secured by a special process of preparation. Its use is indicated in intestinal stasis and its sequelæ, and generally where alimentary toxæmia is present, while it has proved helpful, according to many observers, in dysentery and diarrhœa. Externally as a cataplasma to remove œdema and to relieve the pain and swelling of inflammation it has been successfully employed. The preparation is supplied in 8 oz. cartons.

TETRAFORM.

(British Drug Houses, Ltd., 16–30, Graham-street, City-road, London, N. 1.)

Carbonis tetrachloridum has been used as an inhalant in the relief of hay fever, as an anodyne for neuralgic pains, and as an anthelmintic, especially in the treatment of hook-worm disease in America. In any case the purity of the drug is essential, as impurities such as carbon bisulphide and phosgene are excessively toxic. The British Drug Houses, Ltd., have put upon the market a preparation, Tetraform, which is guaranteed to be free from these and other poisonous substances. The standard of purity which Tetraform is guaranteed to comply with is set out by the B.D.H. firm as follows:—

> "It gives no reaction to the alkali plumbite test for sulphur compounds, including carbon bisulphide, thus indicating the absence of these toxic impurities; it contains no free acid, no chloride, and no free chlorine; it yields no appreciable residue on evaporation; and it gives no reaction to the potassium test for organic matter and aldehydes."

It is claimed to be a perfectly safe remedy in the treatment of ankylostomiasis and other intestinal diseases due to parasites, the doses and age modifications being carefully observed, but its exact action as an anthelmintic is not quite certain.

GLAX-OVO.

(Glaxo House, 56, Osnaburgh-street, London, N.W. 1.)

This new dietetic preparation consists of the solids of milk combined with malt flour, cocoa, sugar, and an antirachitic extract of cod-liver oil in a highly concentrated form. The percentage composition of essential foodstuffs is stated as:—

Moisture ..	2·5	Carbohydrate ..	62·2
Fat	13·3	Ash	3·7
Protein	18·3		

Cane sugar is present to the extent of 18 per cent. and cocoa (containing 22 per cent. cocoa butter) to the extent of 6 per cent. In respect of that factor in which cod-liver oil is peculiarly rich—namely, the factor controlling calcium metabolism—a marked degree of success is claimed, for it appears to have been concentrated no less than 2000 times. Glax-ovo is supplied in the form of a powder contained in air-tight tins, and needs the addition of boiling water only to prepare a beverage with the distinct flavour of chocolate. It provides a means of obtaining the benefit of cod-liver oil without its unpleasant qualities of flavour and repetition.

UBANA.

(Ubana Shokai, 83, Ebury-street, London, S.W. 1.)

This is a crude native sulphur said to be a hot-spring concentrate imported from Japan. When analysed it was found to have the composition:—

	Per cent.
Sulphur	68·9
Moisture	1·5
Acidity (as sulphuric acid)	0·8
Inert matter of a siliceous character	28·8
Iron	trace.

The sulphur is intended for use in a hot bath, two handfuls of the preparation mixed in a bath being sufficient for all purposes, the body remaining immersed for 15–20 minutes. For local application the affected parts may be bathed with a solution of the same strength. Directions are given for the use of Ubana internally in digestive disorders. Apart from its application in diseases of the skin, sulphur has been recommended for neuritis, gout, and some forms of rheumatism.

PRUNOL OR PRUNE JELLY.

(Prunol, Ltd., 4, Pickering-place, No. 3, St. James's-street, S.W. 1.)

Prunol is a preparation of prunes, Demerara sugar, senna, and ginger, things in this or a similar combination well known for their laxative properties. It is a safe remedy for children and has proved useful not only in constipation but as a mild purgative in inflammatory conditions. Where easy and regular motion is desired, the average dose for an adult is one full teaspoonful to be taken when retiring at night, while for children of from 4 to 6 years of age a smaller dose is sufficient.

"KRAFT" CANADIAN PASTEURISED CHEESE.

We have received from Colonial Produce Publicity (47 and 48, Berners-street, London, W. 1) a sample of a cheese prepared by the "Kraft" process of pasteurisation which kills the gas-producing bacillus and enables a rindless cheese to be placed on the market. Cured cheese is blended to taste with fresh cheese, both in finely-divided form, and the blend is placed in a steam-jacketed kettle, containing an agitator, until the product is reduced to about the consistency of soft putty. It is then transferred hot to boxes, previously lined with tinfoil, the cover of which, when nailed on, acts as a press. The envelope obviates the cheese being exposed to dirt or harm, and is a protection against mould, evaporation, and shrinkage. We can testify to the product being both palatable and digestible. It is highly desirable for such a staple foodstuff as cheese to be delivered to the customer in a sealed packet, and the "Kraft" pasteurised cheese is everything that a cheese should be.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 27, 1924.

EDUCATION IN HEALTH.[1]

FROM his office window at the Ministry of Health the Chief Medical Officer looks down on the flow of humanity in the street outside and observes how far the available knowledge of hygiene has penetrated into the everyday life of the people. In some respects the change has been rapid. Where, a hundred years ago, intemperance was the Englishman's besetting fault, gross and widespread drunkenness has almost disappeared. Fifty years ago a commercial firm was able to announce itself as bug destroyer "for the upper classes only," without there being any obvious absurdity in the existence of enough bodily parasites in such circles to make good business. Twenty-five years ago the tight clothing and trailing skirts of women were part of a manner of life which produced a form of anæmia so common as to constitute a considerable part of out-patient material at our hospitals. The prevailing fashion in dress along with more active amusements and the open-air habit have made chlorosis as rare or perhaps rarer than pernicious anæmia. But still, as Sir GEORGE NEWMAN reminds us, people suffering from colds sneeze and cough into each other's faces; too many people live in overheated, ill-ventilated, and stuffy rooms, on leaving which for the less sheltered streets they fall victims to bronchitis and pneumonia; many valuable and cheap foods are almost entirely neglected. The public is unaware that milk, butter, vegetables, fruit, and other foods are preserved, coloured, or adorned with substances which may not be harmless. They have not learned to regard tuberculosis as the result of personal infection or of drinking tuberculous milk, or they would have put these beliefs into effective application. Sound practice lags behind the ascertaining of truth, and Sir GEORGE NEWMAN laments the fact that the enlightenment of the public has not kept pace with the progress of science. Mental hygiene, that most fruitful field for popular health education, is as yet almost untouched; life might be prolonged, its capacity and value enhanced out of measure by periodic medical examination, willingness to accept advice on health maintenance, and diligence to learn the laws of hygiene.

Everyone agrees that public education in health must begin early. What form, Sir GEORGE NEWMAN asks, should the teaching of hygiene take in the elementary schools? On the one hand, the child can be given information respecting the theory of hygiene, or on the other he may be taught by practice to form certain habits. By universal consent the child is just handed a toothbrush and told to clean his teeth. He learns these things because they are accepted as a daily routine. In America they are made a form of kindergarten play. If only Mr. NEVIL MASKELYNE, whose death we deplore, had incorporated some health tricks in his programme countless children would have learned them for life at one visit. Practice is vastly more cogent than precept. At a recent meeting of the Dumbartonshire Education Authority a suggestion that teachers should give special short health talks to pupils was met by the riposte that the Education Authority itself required health talks on the subject of issuing to the children in their schools filthy and dilapidated books. The gloom and grime of many elementary schools further south than Dumbarton, and the condition of their lavatory accommodation, are such as to set a low standard of cleanliness in the minds of many school-children which no amount of precept can subsequently alter. It is for this reason that the school medical service has within it the germ of vastly potent hygienic education. It was only in 1907 that the system of medical inspection and treatment of school-children was established by Act of Parliament, and we can still recall the consternation aroused in 1908 when Dr. JAMES KERR, who has just retired from his great office under the London County Council, gave out that at least 90,000 children in the London schools were urgently requiring medical treatment. Things are changed to-day, when not only do children obtain medical treatment in London as a matter of course, but the school is the acknowledged centre for the control and prevention of disease, and the school medical service the proven means of increasing the health and strength of the population and of diminishing the mortality-rate. The influence of this service has percolated into the life of the whole country, and its principles have even penetrated the public schools.

Health methods will not be accepted by the people of this country if they are foisted upon them against their will. Nevertheless, as we learn[2] from Mr. T. B. PARTINGTON, two years' experience has shown the cinema to be a new force in fighting venereal disease; night after night he has demonstrated in packed halls seating 2000–3000 Lancashire men and women. They were there out of curiosity, you might say. Mr. PARTINGTON meets this objection by recalling the loud applause, given as only northerners can give it, as he pleaded for a higher moral standard for the stamping out of venereal disease in the large manufacturing towns of Lancashire, where a week's campaign resulted in a remarkable increase in the attendance at the venereal disease clinic. The holding of propaganda weeks of various sorts has in many parts of the country taken effective hold of public opinion, whether under the name of Baby Week, Health Week, or Rat Week. Of the written word, the annual report of the medical officer of health is a form of propaganda work of which insufficient use is made; such reports afford opportunity and scope to guide the public in the directions of advance appropriate for the locality. The first and best form of hygienic education is the effective administration of the public health, including medical services. With the possible exception of Leicestershire, the insurance committees, which were entrusted by the Act of 1911 with the duty of giving lectures and publishing information on questions relating to health, have failed to make this provision. They may have realised from the first that the bulk of their educational work could only be performed effectively by the insurance practitioner himself in the ordinary discharge of his duty. On the direct methods for providing supplementary teaching over and above these well-authorised channels, Sir GEORGE NEWMAN makes hints and suggestions which are set down at length on another page. The potentialities for public health teaching of the cinema and of the wireless can hardly yet be properly assessed, but they are evidently boundless.

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[1] Public Education in Health. A Memorandum addressed to the Minister of Health by Sir George Newman, K.C.B., M.D., F.R.C.P., Chief Medical Officer of the Ministry of Health and of the Board of Education. H.M. Stationery Office. 6d.

[2] The New Force in Public Health Propaganda. Fighting Venereal Disease with the Film. By Thomas Bowen Partington, F.I.L., Lecturer to the National Council for Combating Venereal Diseases, 102, Dean-street, London, W.1.

TUBERCULOSIS IN THE SERVICES.

The report on the health of the army for the year 1921, just issued as a Blue-book (H.M. Stationery Office. Price 3*s.*), is the first to be presented by Sir William Leishman, who explains its delayed appearance by the many changes involved in the gradual reversion to a peace footing. It contains much of interest to which we shall return. We have now seen the reports for this year from all three of the fighting services, and have extracted from them the figures given for tuberculosis. It is a little surprising to note that in none of the reports is any special consideration given to these figures, Eighty years ago 89 men died of tuberculosis among the 5000 Foot Guards, a rate of 17·6 per 1000; of hospital admissions from another unit, 236 out of 286 died; and the terrible prevalence of tuberculosis in the army seems to have been the agent which first compelled thought for hygiene in that service. Now, although relatively few deaths are ascribed to tuberculosis as compared with some diseases such as malaria and pneumonia, the total loss to the services is still great. In 1921 it amounted to 721 fighting men. Some instruction may be gained by comparing the prevalence of pulmonary tubercle with that of pneumonia, tonsillitis, and bronchitis in the various military areas. Arranging these in order, beginning with London and the Northern Command, where tubercle is heaviest, downwards to Ireland, where it is least, it will be apparent that pneumonia stands in no relation to tubercle, although in the United Kingdom bronchitis and tonsillitis vary to some extent with it. For stations abroad there appears to be no similarity whatever between the curves. The question arises: Why has Ireland in 1921, with 50,531 men employed there, in circumstances, the report says, of hardship, lower rates than any other Command in the United Kingdom for pulmonary tubercle, tonsillitis, pneumonia, and the second lowest rate for bronchitis? A possible explanation is the want of association, at that time very definite, between troops and civil population. More recent figures may give the clue. In 1921, in the United Kingdom, the highest pulmonary tubercle-rate was 3·1, in London and the Northern Command; the maximum for pneumonia was 6·3, in the Western Command; for bronchitis 48·0, in the Northern Command, already mentioned with the maximum for pulmonary tubercle. London has the highest rate, 62·8, for tonsillitis. These relations deserve further study.

Tubercle (Pulmonary and Other) in the Fighting Services during 1921.

—	Rates per 1000.			Actual numbers.		
	Cases.	Deaths.	Invalids.	Died.	Invalided.	Total wastage.
Army	2·0	0·23	1·43	57	342	399
Navy	2·38	0·28	2·33	31	247	278
Air Force ..	1·7	0·14	1·41	4	40	44
			Total ..	92	629	721

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SPONTANEOUS AND EXPERIMENTAL ENCEPHALITIS IN RABBITS.

The experimental transmission to animals of epidemic encephalitis and other affections of the central nervous system forms the subject of a critical review by Dr. C. Da Fano in the August number of *Medical Science*. Our knowledge of the so-called spontaneous encephalitis of rabbits dates only from 1922, though its occurrence had been suspected by C. B. Bull since 1917. It has now been ascertained that it affects not only rabbits but also mice, and that it occasionally manifests itself in the shape of circumscribed epizoötics. It is more diffuse in certain countries, notably America, than in others, and does not, as a rule, give rise to symptoms. These may, however, be present, particularly when the disease occurs epidemically or if the rabbits are used for experimental procedures on their central nervous system. The onset is usually insidious and the first indication of any trouble is the wasting of the animals. The temperature is at times subnormal, though fever has occasionally been observed. The hair falls out in patches and there is some discharge from the eyes. As the disease progresses emaciation becomes profound and muscular weakness and convulsions occur. Some authors noted persistent drowsiness, followed in most cases by tremor shortly before the development of paralysis which may be slight or marked, general or localised. In such cases the mortality is high, though the animals can survive several days and even recover. Death may supervene during a convulsion, which is sometimes preceded by coma, or takes place in coma.

Histologically, the disease is characterised by small-celled infiltrations, nodular cell aggregations, and focal necrotic areas associated with a variable degree of nerve-cell degeneration. The infiltrations can be meningeal, peri-vascular, subependymal, and parenchymatous and differ greatly in intensity in different animals; they consist of lymphocytes and some plasma cells, while polymorphocytes are, as a rule, absent. The nodular cell aggregations also consist of mononuclear elements of the lymphocytic type, and may be so large as to be visible to the naked eye in stained specimens. The necrotic foci are generally formed of a definitely necrotic centre surrounded by an inner ring of epithelioid cells and an outer layer of mononuclear elements. The malady is probably related to a form of spontaneous nephritis, investigated in 1919 by E. T. Bell and T. B. Hartzell; it is transmissible from animal to animal by cage infection and by intracerebral inoculation of sedimented urine and brain or cord emulsions from sick rabbits, and has been shown to be due to a protozoon-like parasite which according to some authors is a microsporidium belonging to the sporozoa. The parasite has been detected in the brain and kidney lesion of affected rabbits and mice, but its life-cycle is, so far, unknown. Dr. Da Fano suggests that the unsuspected occurrence of this affection has misled various authors in their attempts at transmitting to rabbits syphilis, general paralysis of the insane, and epidemic encephalitis, in so far as they describe symptoms and histo-pathological lesions which he considers characteristic of the spontaneous parasitic disease. Similarly Lucke's observation of spontaneous encephalitic lesions in monkeys is held by the reviewer to invalidate the few recorded instances of presumed transmission of the epidemic disease to those animals.

The last ten pages of the review are devoted to a discussion of the interlaced questions of the herpetic and encephalitic viruses. It is now established that the vesicular fluid of all forms of herpes, other than idiopathic herpes zoster, contains a virus which, when inoculated into rabbits and other domestic animals, gives rise to a meningo-encephalitis or a meningo-encephalomyelitis with involvement of certain cranial, spinal, or even sympathetic ganglia. This experimental disease is generally characterised by a certain incubation period, a peculiar symptomatology, transmissibility in series, and sufficiently characteristic inflammatory and degenerative lesions. It is, in the main, easily distinguished from the parasitic form. The herpes virus is endowed with biological properties which may now and then undergo certain variations and is probably more diffuse than has hitherto been suspected; it has been occasionally found in the saliva, nasopharynx, cerebro-spinal fluid, blood, and even fæces not only of subjects exhibiting skin lesions, but also of apparently healthy carriers.

LEVADITI and other workers have succeeded in isolating from the brain substance, nasopharynx, and cerebrospinal fluid of cases of epidemic encephalitis a limited number of so-called encephalitic viruses. However, when inoculated into rabbits and other laboratory animals, these viruses give rise to a transmissible disease which is clinically and histo-pathologically identical with that due to the herpes virus, and the so-called encephalitic viruses are indistinguishable from herpetic strains by available biological tests. It is, therefore, possible that the so-called encephalitic viruses are in fact only herpetic strains found by chance in the material employed for experimental transmission, and that they may have nothing in common with the ætiological agent of epidemic encephalitis. It would thus appear to be still uncertain whether the unequivocal transmission of epidemic encephalitis to animals has as yet, after all, been achieved; if this should prove to be so its ætiology would have to be investigated anew.

Annotations.

"Ne quid nimis."

THE INDEX GENERALIS.

THE ideal personal reference book for the medical seeker is yet to find. Even the "Medical Register," whose alphabetical arrangement and official accuracy make it so satisfying, suffers from the disability, which we understand can only be removed by Act of Parliament, of containing two smaller alphabetical lists at the end where they may readily be overlooked; and the value of the "Medical Directory," as a more detailed fount of accurate information, is seriously depreciated by the disappearance of the asterisk which implied that entries had been revised to date. All other lists of reference suffer more or less from the varying estimate of who's who and what's what. On a more universal scale, the year-book familiarly known as "Minerva," when first issued in 1891 from the publishing house of K. J. Trübner, in Strasbourg, possessed practically a monopoly as a guide to the learned world. The twenty-third edition appeared at Strasbourg in 1914, the twenty-fifth edition in much diminished form in 1921 as a publication of the Union of Scientific Publishers of Berlin and Leipzig. The basis of "Minerva" is, of course, the German tongue, although the names of institutions are generally given in the language of the particular country. A serious competitor to "Minerva" has now appeared in a handsome English edition of the "Index Generalis," described as the year-book of the universities, libraries, astronomical observatories, museums, scientific institutes, academies, learned societies,[1] of which the French edition came out in 1919 as a thin paper-covered volume. Mr. H. J. Waring who, as Vice-Chancellor of the University of London, commends it to the attention of the scholar, the administrator and all concerned in the development of higher education, indicates in a preface what such an enterprise entails upon editor and publisher. The Index contains more than 6400 separate entries, for the most part in the language of the source from which it arose, except for a few countries of minor importance which are given in French. Technical terms have been avoided as far as possible, but, for such as are used, a short vocabulary is given at the end of the book. An alphabetical list of more than 70,000 names enables the reader to locate anyone who comes within the scope of the book, and the indexer has been kind in indicating whereabouts on the page the name appears. It would be easy to carp at a host of minor inaccuracies or at the coarse yellow paper and rather unattractive type used by the Bordeaux printer. It is also annoying to find the first few sections of the book separately numbered under topographical headings; thus, the British Empire has 165 pages, followed by the United States with 160 pages and by France with 169 pages, a number of advertisements being insinuated as "buffer states." But no one who has frequently felt the want of such a book can fail to be grateful to the editor and the publisher for a work of eminent value and one that will spare the honest seeker hours of fruitless search. We commend the book most cordially wherever it is necessary to identify the learned people of all nations and countries, and desire for it the wide circulation which will enable the publishers cheerfully to bring it up to date year by year and to ensure its substantial accuracy.

PROFESSIONAL PITFALLS.

A STUDY of the annual report of one or other of the great medical protection associations is always a matter of interest to the practitioner in that it brings a realisation, perhaps for the first time, of some of the pitfalls in the rough road of professional life which he *may have been so far lucky enough to escape.* We have on previous occasions in these columns urged the importance to all medical men of ensuring adequate professional protection for themselves, and the report of the Medical Defence Union for the year 1923–24 shows a steady and healthy increase in the number of members, which in July, 1924, amounted to 11,550. The Council of the Union states that the number of cases with which it dealt has increased and that there is reason to believe that charges against medical practitioners are becoming more frequent, possibly because certain actions lately heard in the High Court have encouraged patients to seek to obtain damages from their medical attendants when recovery has been more prolonged or less complete than they imagine it should have been. Members of the Union have been advised by the Council on a variety of subjects which extend alphabetically from Acts of Parliament to X ray burns, including such matters as debt collecting, door plates, herbalists, and housing difficulties. Up to the end of 1923, 76 cases were placed in the hands of the Union's solicitors. Of these cases, 9 were concerned with libel or slander, 25 with malpraxis, 8 with prosecution of unqualified persons, and 34 with arbitration and personal matters. It is noteworthy that actions in which a charge of malpraxis or negligence is raised are greatly in the majority, while there is a marked falling off in actions for libel and slander; and it is also of interest to note that the number of unqualified practitioners for the supervision of whom action has been taken has remained fairly constant since 1909. This branch of the Union's work is one that is generally recognised as being of extreme importance not only to the medical profession but to the public at large. But this figure does not represent the total number of cases that were investigated by the Council in which no legal action could be taken, as bogus medical practitioners for the most part are fully alive to the significance of the penal clause of the Medical Acts, which prohibits the wilful and false assumption of title only and not unqualified practice, and thus manage to remain just within the law while imposing on the public. Unfortunately, there is no immediate prospect that any alteration of the law in this respect will be obtained. A marked decrease in the number of prosecutions for libel against medical men, which has fallen from 31 in 1919 to 9 in 1923, may be interpreted as an indication of the widespread recognition of the power of the Union.

The solicitors give details of a few cases which cannot fail to be instructive and illuminating. The first quoted deals with the action which was conducted on behalf of a member of the Union against several officials of a miners' lodge who had circulated a pamphlet amongst the other members of the lodge to the effect that the medical man was incompetent and biased against the workmen in his capacity as a medical referee under the Workmen's

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[1] London: J. M. Dent and Sons, Ltd.; Paris: Editions Spes. 22s. 6d. Issued under the direction of Dr. R. de Montessus de Ballore, D.Sc., Laureate of the Institute of France.

Insurance Act. After a protracted hearing the case resulted in a verdict for the medical man, with £100 damages. Such a case as this will help to improve the position of medical men practising among miners. Reference is again made to the extreme importance of securing an X ray photograph in a case of suspected fracture or dislocation. This we referred to in a similar connexion some months ago,[1] and is emphasised in a clinical note which appears on p. 649. During the year the solicitors were consulted on several occasions by medical men holding public offices where the attempt was made by the public authorities under whom they were employed to reduce their salary, and it was pointed out that where a contract provides for the employment of an official at a fixed salary, that salary cannot be reduced save by mutual consent, and the only way of enforcing reduction is by termination of the existing contract and the creation of a fresh contract at a reduced salary. This view, the solicitors state, has now been adopted by the Ministry of Health. A word of advice on the conduct of any case is always valuable, and the solicitors make a special appeal to medical men consulting them that a full statement of the facts bearing on the case directly or indirectly should be made, and they add: "Members of the medical profession will appreciate that the correct diagnosis and treatment of a case may depend on details or symptoms which appear to the layman to be insignificant and to have no bearing. This is equally true of legal matters." An interesting case is reported where a complaint was made against a medical man of employing a woman to attend childbirth who was not certified under the Midwives Act of 1892. The solicitors warn medical men to be on their guard against the presence of unqualified midwives at any obstetrical case. Such women are liable to make use of doctors to cover them in their practices. Medical men by virtue of their calling are practically under obligation to attend any case of emergency, but when they are called in by an uncertified midwife they run a considerable risk if they sign a certificate to enable the mother to obtain maternity benefits under the National Health Insurance Acts. It is wise for physicians, if they receive a series of these emergency calls from uncertified women, to make it strictly clear either that they will not respond to any future calls or if they do respond that the woman in question must at once leave the case.

As an instance of a liability which may be unwittingly incurred in connexion with the sale of a practice by a medical man, the following case is worthy of quotation in some detail. The solicitors state:

> A member of the Union inserted an advertisement in the medical press notifying his intention to dispose of his practice and inviting purchasers to communicate direct with him. He advisedly did not consult agents, as he preferred to effect a sale without their intervention. That this practice was for sale came to the knowledge of a certain firm of medical transfer agents, who wrote the member informing him that they were sending down certain possible purchasers. The member did not acknowledge this letter in any way, though he saw the gentlemen who were sent by this firm, but he did not come to terms with them. Subsequently, another would-be purchaser came down, who was sent by these agents, which fact was never communicated to the member. Eventually, this gentleman purchased and the agents put forward a claim that the sale had been effected through their instrumentality. We were thereupon consulted by the member. The fact that the member had seen the original would-be purchasers sent down by these agents without informing them that he refused to deal with them in any way, in our opinion, was tantamount to accepting their services, and we thought that in the circumstances the Court would recognise their claim. We are glad to say, however, that we were able to induce the agents to accept a reduced fee.

If medical men avail themselves of the assistance of medical transfer agents, even though such assistance is volunteered and not invited, they may make themselves liable for the services thus rendered, and it is therefore advisable to refuse this assistance at once if it is not desired.

The benefits of the Union have been increased in two important directions. The first is geographical, in that membership is now extended to medical practitioners practising in the Irish Free State, Northern Ireland, the Channel Islands, and the Isle of Man; the second is financial, as from May 1st, 1924, the indemnity against damages and costs of the other side is unlimited. This latter extension is the outcome of the alarm caused in the profession by the damages originally imposed by the High Court in the Harnett case, and the policy of unlimited indemnity has been adopted both by the Medical Defence Union and the London and Counties Medical Protection Society. The solicitors' report ends with a tribute to the esprit de corps among members of the sister profession of medicine, which it would, perhaps, hardly be seemly to quote in these columns.

EDUCATIONAL FACILITIES FOR MENTALLY DEFECTIVE CHILDREN.

THE problem of the mentally defective child is one with which sociologists have of late been much concerned, as the discovery that such children may be the pupal stage of certain social parasites—the unemployables—is of recent date. Yet there is evidence to show that thoughtful and adequate educative measures adopted towards these unfortunate children can make them in many cases worthy members, however humble, of the community. The Board of Education have for some time had under consideration the position of mentally defective children in the country generally, and they have recently issued a Circular (No. 1341) to the local education authorities, inviting coöperation in doing all that is possible under existing circumstances to ameliorate the lot of such children. At the moment it is impossible to make fully adequate provision for this work, owing to defects in obtaining suitable accommodation and funds, but, the Board points out, much can be done, even under present conditions, towards realising the aims of the Mental Deficiency Act of 1913 and the Elementary Education (Defective and Epileptic Children) Act of 1914. The first duty devolving on the local education authority is to make a thorough ascertainment of all mentally deficient children in their area who will thereby fall into two classes: first, those who ought to be notified forthwith to the Mental Deficiency Committee, and second, those who ought to be sent to special schools. Legal responsibility for the first class ceases as far as the local authority is concerned on notification. The second class, the important one, is further subdivided at present of necessity into two groups—namely, those for whom special school accommodation is available, and those who, in the absence of such provision, must either attend the public elementary schools or stay at home. Children in the special schools are supervised, under the Act, up to the age of 16, when they are either discharged as fit members of society, or, if need be, notified to the Mental Deficiency Committee and placed in institutions or under guardianship. Where no special school exists supervisory arrangements can be exercised through school nurses, care committees, paid welfare workers, or voluntary organisations, towards the cost of which the Board are prepared to furnish reasonable grants. At the age of 16 the mentally deficient child passes out of the sphere of the local authority, and it is at this point that a most serious gap exists in the educative machinery, as notification of appropriate cases to the Mental Deficiency Committee is often overlooked. The Board emphasises most earnestly the duty of the local authority in passing under review periodically all mentally defective children under the age of 16 in order that this gap may be bridged, and that the children may not be lost in the general population only to be rediscovered by the Mental Deficiency Committee or the police when from lack of supervision and help they have got into trouble and may have done serious damage both to themselves and to the community. The problem of the child who does not require to be notified is not ended when he or she is passed out from the special school or its equivalent at the age of 16; employment must be secured and useful citizenship assured. Further supervision by an "after-care" association is of the utmost value. In Birmingham, the Special Schools After-care Subcommittee has been in existence since 1910. Its duties include keeping a record of the subsequent histories of former pupils of the special schools in the city and assisting them to find employment. The total number of former pupils in work has risen owing to the enhanced demand for labour in Birmingham in the past year, and 37 per cent. are shown to be earning wages as compared with 35 per cent. in 1922. In view of the allegations so often made that all criminals are mentally defective, it is interesting to note that an examination of the records of the Committee extending over a period of 21 years and relating to more than 3000 defectives shows that, except for certain cases of immoral conduct and others of petty thieving, criminal offences have been few. The work done by this Committee is of inestimable value not only to the individual concerned but to the community.

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[1] THE LANCET, 1924, i., 1115

ENERVATION OF THE KIDNEY.

PERIARTERIAL sympathectomy of the large vessels of the extremities is, owing to the strenuous advocacy of Leriche, undergoing a somewhat extensive trial, though as yet it is too soon to speak with any confidence of the ultimate place which the operation will assume amongst surgical procedures. E. Papin[1] was the first to suggest and carry out a similar operation for certain affections of the kidney. A study of the subject has been made by P. Flandrin[2] in Prof. Legueu's clinic. The sympathetic nerves for the kidney come off the semilunar ganglia and run a more or less regular course along the upper and posterior aspects of the renal artery, so that a decortication of that vessel will cut off all nerves running to the kidney. The operation upon the renal hilum may be comparatively simple if there is a single renal artery and if the pedicle can be approached at some distance from the kidney itself. But should the kidney not admit of delivery to the surface, or should there be an accessory renal artery, the procedure may become technically very difficult of accomplishment, and, apparently, there is a danger in the attempt of doing such damage to the renal veins that nephrectomy becomes the only outlet from a surgically embarrassing situation. The operation has been performed mainly for two conditions, nephralgia without discoverable lesion, and those cases of early hydronephrosis dependent upon a narrowing at the uretero-pelvic junction in which a plastic procedure or nephrectomy seems scarcely justifiable. As applied to the latter condition it will be most interesting to watch results which already bid fair to prove satisfactory. C. A. Pannett[3] considers that one group of these cases of hydronephrosis depends upon a reflex spasm set up at the uretero-pelvic junction, perhaps associated with a polyuria, and that in another group polyuria alone may cause a distension of the renal pelvis if it be associated with a congenital narrowing of the renal excretory duct at this particular point. It is possible that both the reflex spasm and the rate of renal secretion might be altered as the result of cutting off the kidney from its connexion with the central nervous system. Flandrin has studied the changes in urinary secretion as a result of enervation of the kidney. On the whole, he reports no changes in the urine after the immediate effect of the operation has worn off, but in two cases the secretion of urine was much interfered with. In these two patients the section of the renal nerves was particularly easy and certainly complete. He suggests that, perhaps, in the earlier operations, before facility in technique had been gained, a total enervation was not achieved and the good results depended upon the incompleteness of the operation. As to the subjective results to the patients, there has been uniformly an improvement. The lumbar pain has disappeared and the renal crises have been absent in all the small series of cases reported upon. These observations are exceedingly interesting and worthy of further study.

VETERINARY OBSERVATION.

AT the opening of the Conference of the National Veterinary Association, which met recently in Aberdeen, the chairman appositely referred to the veterinary profession as the one, par excellence, in which observation was required. It was Prof. F. M. Caird, of Edinburgh, who was in the habit of initiating his students by making them practise "veterinary surgery"—the forming of a diagnosis independent of the questionable advantage of the patient's own account of his condition. It is unfortunate that the great mass of veterinary observation lies beyond the reach of even the medical man who takes the broad view of his subject. Many of the papers read at the above Conference had a direct medical interest—for example, Prof. S. H. Gaiger's discussion of the anaerobic infections in domestic animals. One can scarcely doubt but that an investigation of these conditions, as they occur among animals, will throw light on the anaerobic infections to which man is subject. A paper by Dr. J. B. Orr on the effect of nutrition on the incidence of disease was characteristic of the present trend of medical thought which was so long under the influence of purely bacteriological conceptions. In this connexion the veterinary practitioner has much to contribute. It is doubtful whether in the past more attention has not been paid to the feeding of stock than to the nutrition of the human race. Animals kept under what are at best artificial conditions demand in no small degree the applications of principles of feeding and hygiene which are based on sound scientific investigations or are the outcome of an interested empiricism. But between this accumulation of clinical knowledge, whether traditional or the result of research, and its application to human nutrition and the prevention of disease there has been in the past a great gulf fixed. That this gulf is now being bridged is largely due to the realisation—in America rather than in this country—that in the investigation of the physiology and pathology of domestic animals a double end is being served, the first an economic one, the second an illuminating of many dark places in the science of human medicine.

RECOVERY FROM SPINAL FRACTURE.

IT is a curious fact that hitherto little information has been available as to the ultimate fate, as a class, of persons whose spines have been fractured. Dr. Augustus Thorndike, of the Surgical Division of the Maria Hospital in Stockholm, has recently[1] attempted to fill this gap in our knowledge by seeking an answer to the question: What is the fate of these patients in terms of ability to work? At his hospital between the years 1914 and 1924 there were 47 cases of fracture of the spine; they were consecutive, unselected cases, in all of which the diagnosis was confirmed by X ray examination, an operation, or a necropsy. Only in six cases were the fractures confined to the spinous processes. The bodies of the vertebræ were involved in the remaining 41 cases, 34 of which were unassociated with signs referable to the spinal cord. The fractures were cervical in 8 cases, dorsal in 18, lumbar in 18, and sacral and coccygeal in 3. The most frequent site of fracture was from the ninth dorsal to the fourth lumbar vertebra, and in as many as 16 cases two or more vertebræ were injured. The accidents were industrial in 57·7 per cent., and as great a proportion as 81 per cent. of these industrial

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[1] Papin and L. Ambard: Arch. des maladies des reins et des org. génito-urin., 1922, 1.

[2] Arch. urolog. d. l. clin. d. Necker, 1924, iv., 101.

[3] Brit. Jour. Surg., 1922, ix., 509.

[1] Acta chir. Scand., 1924, lvii., 339.

Insurance Act. After a protracted hearing the case resulted in a verdict for the medical man, with £100 damages. Such a case as this will help to improve the position of medical men practising among miners. Reference is again made to the extreme importance of securing an X ray photograph in a case of suspected fracture or dislocation. This we referred to in a similar connexion some months ago,[1] and is emphasised in a clinical note which appears on p. 649. During the year the solicitors were consulted on several occasions by medical men holding public offices where the attempt was made by the public authorities under whom they were employed to reduce their salary, and it was pointed out that where a contract provides for the employment of an official at a fixed salary, that salary cannot be reduced save by mutual consent, and the only way of enforcing reduction is by termination of the existing contract and the creation of a fresh contract at a reduced salary. This view, the solicitors state, has now been adopted by the Ministry of Health. A word of advice on the conduct of any case is always valuable, and the solicitors make a special appeal to medical men consulting them that a full statement of the facts bearing on the case directly or indirectly should be made, and they add: "Members of the medical profession will appreciate that the correct diagnosis and treatment of a case may depend on details or symptoms which appear to the layman to be insignificant and to have no bearing. This is equally true of legal matters." An interesting case is reported where a complaint was made against a medical man of employing a woman to attend childbirth who was not certified under the Midwives Act of 1892. The solicitors warn medical men to be on their guard against the presence of unqualified midwives at any obstetrical case. Such women are liable to make use of doctors to cover them in their practices. Medical men by virtue of their calling are practically under obligation to attend any case of emergency, but when they are called in by an uncertified midwife they run a considerable risk if they sign a certificate to enable the mother to obtain maternity benefits under the National Health Insurance Acts. It is wise for physicians, if they receive a series of these emergency calls from uncertified women, to make it strictly clear either that they will not respond to any future calls or if they do respond that the woman in question must at once leave the case.

As an instance of a liability which may be unwittingly incurred in connexion with the sale of a practice by a medical man, the following case is worthy of quotation in some detail. The solicitors state:

> A member of the Union inserted an advertisement in the medical press notifying his intention to dispose of his practice and inviting purchasers to communicate direct with him. He advisedly did not consult agents, as he preferred to effect a sale without their intervention. That this practice was for sale came to the knowledge of a certain firm of medical transfer agents, who wrote the member informing him that they were sending down certain possible purchasers. The member did not acknowledge this letter in any way, though he saw the gentlemen who were sent by this firm, but he did not come to terms with them. Subsequently, another would-be purchaser came down, who was sent by these agents, which fact was never communicated to the member. Eventually, this gentleman purchased and the agents put forward a claim that the sale had been effected through their instrumentality. We were thereupon consulted by the member. The fact that the member had seen the original would-be purchasers sent down by these agents without informing them that he refused to deal with them in any way, in our opinion, was tantamount to accepting their services, and we thought that in the circumstances the Court would recognise their claim. We are glad to say, however, that we were able to induce the agents to accept a reduced fee.

If medical men avail themselves of the assistance of medical transfer agents, even though such assistance is volunteered and not invited, they may make themselves liable for the services thus rendered, and it is therefore advisable to refuse this assistance at once if it is not desired.

The benefits of the Union have been increased in two important directions. The first is geographical, in that membership is now extended to medical practitioners practising in the Irish Free State, Northern Ireland, the Channel Islands, and the Isle of Man; the second is financial, as from May 1st, 1924, the indemnity against damages and costs of the other side is unlimited. This latter extension is the outcome of the alarm caused in the profession by the damages originally imposed by the High Court in the Harnett case, and the policy of unlimited indemnity has been adopted both by the Medical Defence Union and the London and Counties Medical Protection Society. The solicitors' report ends with a tribute to the esprit de corps among members of the sister profession of medicine, which it would, perhaps, hardly be seemly to quote in these columns.

EDUCATIONAL FACILITIES FOR MENTALLY DEFECTIVE CHILDREN.

THE problem of the mentally defective child is one with which sociologists have of late been much concerned, as the discovery that such children may be the pupal stage of certain social parasites—the unemployables—is of recent date. Yet there is evidence to show that thoughtful and adequate educative measures adopted towards these unfortunate children can make them in many cases worthy members, however humble, of the community. The Board of Education have for some time had under consideration the position of mentally defective children in the country generally, and they have recently issued a Circular (No. 1341) to the local education authorities, inviting coöperation in doing all that is possible under existing circumstances to ameliorate the lot of such children. At the moment it is impossible to make fully adequate provision for this work, owing to defects in obtaining suitable accommodation and funds, but, the Board points out, much can be done, even under present conditions, towards realising the aims of the Mental Deficiency Act of 1913 and the Elementary Education (Defective and Epileptic Children) Act of 1914. The first duty devolving on the local education authority is to make a thorough ascertainment of all mentally deficient children in their area who will therby fall into two classes: first, those who ought to be notified forthwith to the Mental Deficiency Committee, and second, those who ought to be sent to special schools. Legal responsibility for the first class ceases as far as the local authority is concerned on notification. The second class, the important one, is further subdivided at present of necessity into two groups—namely, those for whom special school accommodation is available, and those who, in the absence of such provision, must either attend the public elementary schools or stay at home. Children in the special schools are supervised, under the Act, up to the age of 16, when they are either discharged as fit members of society, or, if need be, notified to the Mental Deficiency Committee and placed in institutions or under guardianship. Where no special school exists supervisory arrangements can be exercised through school nurses, care committees, paid welfare workers, or voluntary organisations, towards the cost of which the Board are prepared to furnish reasonable grants. At the age of 16 the mentally deficient child passes out of the sphere of the local authority, and it is at this point that a most serious gap exists in the educative machinery, as notification of appropriate cases to the Mental Deficiency Committee is often overlooked. The Board emphasises most earnestly the duty of the local authority in passing under review periodically all mentally defective children under the age of 16 in order that this gap may be bridged, and that the children may not be lost in the general population only to be rediscovered by the Mental Deficiency Committee or the police when from lack of supervision and help they have got into trouble and may have done serious damage both to when out of health. The benefit popularly derived from a change of air may, indeed, possibly be due rather to a change of water. The human body is sensitive to the influence of physical agencies, the effects of which are apt to be overlooked by reason of their very simplicity and familiarity. There is the added difficulty of clearing the stage for a single remedy of any kind, and it is especially difficult to separate what is essential in climatic treatment from what is accidental and adventitious. So much, however, has been learnt of the intimate physical characters of water and waters in the last 20 years that the claims of hydrotherapy may well have to be considered in the light of them. Dr. Fox's book is of value in providing theorems which can be put to an exact test. He crystallises his conclusions into 50 aphorisms, such as the following:—

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[1] THE LANCET, 1924, i., 1115

(9) As there is an optimum temperature for life, so disease may be regarded as a question of heat.

(17) Deep-seated organs are affected by operating on related areas of the skin.

(22) The vapour bath counteracts the ill-effects of the British climate.

(36) Many remedies cure by intensifying a chronic process.

(44) Cardio-vascular invalids are best treated in their own country.

These challenges to medical thought may be taken up with some gusto by those who think otherwise and lead to a rediscussion of some too readily accepted views. The brief section in Dr. Fox's book on the choice of a spa hardly does more than touch the fringe of large and debatable questions.

THE PRINCIPLES OF TONSILLECTOMY.

THE tonsil shares with the appendix the unenviable reputation of causing more trouble than it is worth in the economy of the body, for there is no evidence to show that tonsillectomy even in infancy destroys an important function from the lack of which a patient would suffer, while it is generally believed that enucleation lessens the liability to infectious diseases. Dr. A. Brown Kelly, in a discussion of the subject at the recent annual meeting of the British Medical Association, at Bradford (Section of Laryngology and Otology), said that the two most common pathological conditions of the tonsils were sepsis and hypertrophy. The latter condition, he held, was most common in children, and there need be no hesitation in removing the tonsils and adenoids from a healthy child of 2 years or even 18 months. Tonsillar sepsis rather than hypertrophy was associated with adults, and, indeed, many tonsils which on inspection and on squeezing were apparently healthy, were on microscopical examination found to be diseased. The faucial tonsil is particularly adapted for the production of septic foci. The detection of a septic focus in a tonsil, Dr. Brown Kelly said, was a matter of great importance and sometimes of some difficulty, but the presence of caseous plugs in the crypts and enlarged cervical tonsillar glands was a valuable aid to diagnosis, although the absence of these signs did not preclude the presence of a small encapsuled abscess in the tonsil. He mentioned several points which had to be noted in advising operation in cases which suffered from systemic diseases known to be caused at times by septic tonsils: (1) if the focus was found, or if the patient was liable to attacks of tonsillitis and cervical adenitis, the tonsil should be removed and the patient told that the local condition would be cured, but that the improvement of the systemic disease could not be guaranteed; (2) if the onset of the tonsillar infection coincides with that of the systemic disease, the focus was probably in the tonsil; (3) if there were other septic foci—in the teeth, sinuses, or alimentary canal, these should be eliminated before advising tonsillectomy; (4) if the tonsil was clinically healthy, and there was no evidence pointing to a relationship between the tonsil and the systemic disease, enucleation of the tonsil should not be recommended. At the conclusion of the meeting resolutions were unanimously passed (1) that tonsillectomy by enucleation was the only effective operation; (2) that the operation should not be conducted as a minor operation, but as one of the lesser major class of operation; and (3) that the operation should only be undertaken after expert opinion had been given.

THE first social evening of the session at the Royal Society of Medicine, 1, Wimpole-street, W., will be held on Thursday, Oct. 16th, at 8.30 P.M., when Fellows and guests will be received by the new President, Sir StClair Thomson. At 9.30 P.M. Dr. W. T. Grenfell of Labrador will give a brief discourse, with lantern illustrations, on "Medicine in a Corner of the Empire."

Sir Robert Blair, who recently retired from the post of education officer to the London County Council, is one of the candidates for the chairmanship of Convocation of London University. His election would bring to Convocation a wealth of educational knowledge and experience such as few possess, and the support he gave to the medical staff in the service of the London schools is sufficient guarantee that he would serve well the interests of medical education.

The Services.

COLONIAL MEDICAL SERVICE.

THE following appointments have been made in the West African Medical Staff: Dr. T. A. Dowse to be a senior sanitary officer in Nigeria, in succession to Dr. W. S. Clark, promoted, and Dr. P. S. Selwyn Clarke to be a senior sanitary officer in the Gold Coast, in succession to Dr. A. C. Lorena, who is about to retire from the service.

ROYAL ARMY MEDICAL CORPS.

Maj. K. A. C. Doig retires on retd. pay on account of ill-health.

Capt. (prov. Maj.) H. W. L. Allott reverts to the substantive rank of Capt.

ROYAL AIR FORCE.

Flying Officer E. D. Gray is transferred to the Reserve, Class D.2.

INDIAN MEDICAL SERVICE.

Majs. A. F. Hamilton, A. A. McNeight, A. D. White, H. C. Buckley, N. M. Wilson, J. S. O'Neill, M. R. C. MacWatters, W. H. Hamilton, and J. Cunningham to be Lt.-Cols.

Capts. S. Gordon, B. F. Eminson, A. Kennedy, and J. C. John to be Majs.

The King has approved the retirement of Lt.-Col. N. W. Mackworth.

Lt. Nilratan Chatterjee relinquishes his tempy. commn. and is permitted to retain the rank of Lt.

DEATHS IN THE SERVICES.

Surg.-General William Richard Browne, C.I.E., I.M.S., retd., who died at Soldanelle, Rougemont, Switzerland, on Sept. 16th, at the age of 74, joined the service, in which he had a distinguished career, in 1873. After holding various positions in Southern India, and seeing service in the suppression of the Rumpa Rebellion 1879–80, he became, in 1883, resident surgeon in the Madras General Hospital and professor of pathology in the Medical College, a position which he held till 1890. In that year he was appointed professor of surgery, and later was elected a Fellow of the College. In 1901 he became the Principal of the Medical College. Subsequently Surg.-General Browne returned to army duty, and was appointed P.M.O. of the Madras district. In 1905 he was appointed surgeon to the Viceroy and retired in 1908.

THE WEST AFRICAN MEDICAL STAFF LIST.

WE have received from the Colonial Office a copy of the West African Medical Staff List (Waterlow and Sons, Ltd., London) containing the appointments to the staff as on July 8th, 1924. The list of medical officers is given first in seniority, then by colonies, and finally an alphabetical list with their services. Officers who desire additions or corrections to be made in their records of service should communicate with the Editor of the W.A.M.S. List, Colonial Office, Downing-street, London, S.W. 1.

accidents concerned the building trade, dock and common labour. After discussing briefly the modern treatment of fractures of the spine, Dr. Thorndike gives an account of the issue in his series. Of the seven patients whose spinal cords were injured, five died, one remained in hospital, and one could not be traced. Of the 40 patients without spinal cord symptoms, three were still in hospital, three had died of causes other than the accident, and ten could not be traced. Of the 23 patients who were re-examined by the X rays, all were found to have recovered sufficiently to return to work—in most cases to full-time work at their former occupation. The most important feature of this paper is its lesson that, given time and proper treatment, most fractures of the spine, provided the cord is not compressed, do not permanently incapacitate the patient who, if his occupation is clerical and not manual, may expect to return to his former work without loss of efficiency. The manual worker may also hope to do so, but after a longer interval than the clerical worker requires. The average time lost by those of Dr. Thorndike's patients who recovered was 330 days —a period long enough to disable financially most workers for whom there is no accident insurance. Dr. Thorndike concludes with the hope that more statistics may be published on this subject so that comparisons can be made between his material and larger series of cases.

THE SKIN CIRCULATION.

The demonstration, within recent years, of the independent contractility of the capillaries, together with improvements in technique for the examination of the skin capillaries, has caused a good deal of attention to be focused on the circulation in the skin. We know, for instance, that the colour of the skin gives an indication, and a very valuable one, of the condition of the capillary vessels within it, while the temperature of the skin surface enables us to judge of the state of the skin arterioles. Thus the skin can be cold and blue, indicating dilated capillaries and constricted arterioles, or cold and white, showing general vascular constriction, or warm and red when all the vessels are dilated. The study of cyanosis thus takes on a local as well as a general aspect. An account of this interesting subject may be studied in Prof. August Krogh's work on "The Anatomy and Physiology of Capillaries" (1922, Yale University Press). Some of the reactions of the skin to stimuli are also of considerable interest. After the application of mechanical stimuli to the skin there is often a transient red flush followed by the appearance of a localised constriction indicated by intense pallor. Sir Thomas Lewis has shown that this is a constriction of considerable intensity requiring a good deal of internal pressure to open up the capillaries again. The contractility of the skin vessels is to a considerable extent independent of the central nervous system, and, according to Prof. J. van Breemen,[1] thermal excitation provokes vascular reaction even after section of the cutaneous nerves. In an important article he shows how there is a definite relation between the amount of blood in the skin and that in the deeper structures of the body—the so-called law of Dastre and Morat—expressing this by saying that these amounts vary in inverse ratio. There is also believed to be a relation between the blood in certain parts of the skin and that in certain definite internal parts. Thus stimulus applied to the foot causes a contraction of the blood-vessels of the kidneys, while the stimulus of cold applied to the inner side of the thigh causes contraction of the uterine vessels. Further, there is a relation, expressed by the term "consensual reflex," between the skin of the two sides of the body. In accordance with this law, the application of cold to the skin of one arm will cause constriction of the skin vessels of both arms, as may be proved by plethysmographic tracings. Another characteristic of the skin circulation, to which Prof. van Breemen draws attention, is the extent to which it is affected by the contraction of the skin muscles. When the arrectores contract, not only does an erection of the hairs follow but the skin is emptied of blood as a result of the pressure put upon it. These facts are of practical interest in connexion with the mechanism of "taking cold," about which Dr. S. E. Kark writes on p. 683, and it would be interesting to know more about them.

THE NEW MEDICAL BUILDINGS AT CLEVELAND.

A member of our staff who has returned from a visit to the newly completed block of medical buildings at the Western Reserve University, Cleveland, Ohio, found that they left nothing to be desired as regards structure and equipment. The ground-plan of the block, situated in the suburbs of this beautiful forest city, is in the form of the letter E; the middle wing is occupied by staircase, and the L-shaped portions on either side of this contain the various departments. There is a large separate power-house and a central plant, from which refrigeration is "piped on" to each floor to supply rooms at suitable temperatures. Each department has its own well-equipped library and lecture room, and there are abundant research rooms, in which work has already commenced. The laboratories are equipped with every modern need in the way of benches, fume cupboards, compressed air, vacuum, distilled water supply, and so on, but there has been no money wasted on extravagant halls and staircases. Features of especial interest are the departments of pharmacology, experimental medicine, physiology, and anatomy. The teaching part of the pharmacology department, under Prof. T. H. Sollmann, comprises an excellent laboratory for chemical pharmacology, as well as the usual experimental pharmacology department; the department of experimental medicine, under Prof. Neil Stewart, is actively occupied with research work, especially on the suprarenals; the physiological department, directed by Prof. C. J. Wiggers, has admirable student arrangements for the study of human and mammalian physiology, as well as fully-equipped laboratories for the special investigation of the circulation. The most striking department, to an English visitor, is the anatomical, under the direction of a Manchester graduate, Prof. T. Wingate Todd. This is fully equipped for teaching and research, has a remarkable museum, and a surprising collection of human and animal skeletons, all fully described. The system of collecting data relating to the cadavers is noteworthy, as are also the arrangements for making skeletons, of which some 1200 have so far been collected in the course of a series of investigations on quantitative human osteology. We offer our sincere congratulation to the Western Reserve University and to Prof. Sollmann, who, as chairman of the Constructions Committee, has had much of the arrangements in hand, on a remarkable achievement for the advancement of medical knowledge.

MIXED DRINKS.

There is a tendency, Dr. R. Fortescue Fox remarks,[1] for water-supplies to become more and more a compound of many sources, so that the great majority of people are compelled to drink mixed waters and never drink from a single source. This is true of the natural waters of lakes and rivers as well as of the water laid on in London and other large centres. Only the spring is an unmixed product, and from this basis Dr. Fox goes on to develop the theme, started in a series of lectures given at the University of London, that there may be some distinctive quality of value in water from a single spring. In many parts of the world, he mentions especially India and the West of England, there is a strongly-rooted popular belief in the efficacy of a change of water the mental attitude of the individual, a discussion in which the physician may at times advantageously adopt the Socratic method after the patient has laid down his own point of view.

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[1] Archives of Medical Hydrology, 1924, No. 6, p. 179.

[1] Medical Hydrology: Outlines for Practitioners and Students. Based upon Lectures given at the University of London by R. Fortescue Fox, M.D. London: J. and A. Churchill. 1924. Pp. 136.

Revival of a Lost Memory.

It is a matter of judgment how much the patient should be pressed with direct questions, but where time permits it is better to wait patiently rather than, by producing denials, make subsequent avowals difficult. An ever-recurring trouble is remorse at masturbation, past or present, and the physician must be courageous enough to recognise that the dreadful effects ascribed to it are imaginary, that the habit is so common as to be almost a typical phase in sex development, and that the greatest problem in regard to masturbation is the horror we profess towards it. If the physician is able to adopt this attitude he finds less difficulty in dealing with the associated remorse; but even then he may fail, and a slight acquaintance with psycho-therapy enables him to recognise that he is dealing with an emotion arising from some deeper complex and secondarily attached to the masturbation. This displacement of emotion is characteristic of nervous symptoms and is of practical importance in treatment. A simple technique consists in placing the patient upon a couch, making him describe and, if possible, feel the emotion concerned—the feeling associated with a specific phobia, for example—and urging him to remember any occasion in the past on which the same emotion was felt. This method was successful in the war cases, and if the practitioner only once revives a lost memory by it he gains an insight into mental processes which reading does not give him. While a full analysis may not be practicable for the practitioner, he should be able to recognise those cases in which the severity of the symptoms demands it and the age, temperament, and circumstances of the patient render it possible.

The physician's influence must be used in supporting the patient and encouraging him to carry on the duties of life. Since a minor psychosis is, from one aspect, an attempt to escape from difficulties, the patient should be encouraged to persevere in spite of his symptoms. A practical point is that if a man wakes up fit in the morning, but soon tires and becomes "washed out" before the day is over, he needs a holiday; but if he wakes depressed and unrefreshed, to improve as the day goes on and become fit by the evening, he needs treatment for his anxiety and stimulation to stick to his work. The aims of the family practitioner should be to clear up those causes of anxiety which are accessible and to gain a personal influence by properly understanding the patient. The successful treatment of anxiety states must, like all treatment, depend upon experience. There is no lack of material. The real difficulty facing the practitioner is to find time *properly* to investigate it.

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DUST AND DISEASE FROM THE CARDING OF WOOL.
A clause in the new Factory Bill *requires that* "where there is any dust or fume of an injurious or offensive character, or any substantial quantity of dust of any kind, all practical measures shall be taken to *protect the* workers against inhalation of the dust or fume." It is also stated that where the nature of the process permits or makes it "practicable" exhaust appliances shall be provided and maintained as near as possible to the place of origin of the dust or fume. The operatives contend that the large amount of lung disease and suffering from lung complaints is due to the excessive amount of dust in the cardroom. With a view to arrive at a satisfactory solution *and agreement*, Mr. E. F. May, superintendent-inspector of factories and workshops for the East Lancashire division, and representatives of the employers and operatives jointly have *visited some selected mills* in Oldham and Rochdale. Other mills will be inspected, and it is hoped that this joint committee will reach a satisfactory arrangement before this particular clause of the new Factory Bill is laid before the House of Commons.

Special Articles.

PUBLIC EDUCATION IN HEALTH.

SIR GEORGE NEWMAN'S MEMORANDUM.

Sir George Newman has submitted to the Minister of Health a Memorandum on the subject of Public Education in Health (H.M. Stationery Office. 6*d*.), prepared some months ago, but delayed by pressure of official work. In this Memorandum the Chief Medical Officer reviews the remarkable voluntary health movement which has characterised this country for many years past, and in which Great Britain has taken the lead among the nations; but that other means and methods are now available, some of them more formal and official than in earlier days does not, he says, detract from the honourable and valuable work accomplished by the pioneers. The time seems now to have come when the responsibility of central and local authorities in this matter of public education in health should be more fully appreciated, particularly in view of the fact that national health organisation has not kept pace with advance in the science and art of preventive medicine.

The Memorandum deals successively with the personal aspect of preventive medicine, the educational work of the Ministry of Health, of the Board of Education, of local authorities, of voluntary bodies, and public health education in other countries. At the end Sir George Newman makes some general observations on the present position in England and Wales, and draws some conclusions which are thus tersely set out. First, there has been a growth of knowledge in the science and art of medicine and its application to many morbid conditions now known to be preventable; secondly, there has been a rapid development of the whole system of sanitary governance and public medical services—*and public opinion has not kept pace with these two profound changes.* Yet without an enlightened public opinion the measure and value of scientific and legislative advance is impaired. It is true that attempts have been made—all of them public-spirited, many of them gallant, and a few of them even heroic—by the voluntary service of persons or societies to meet this situation and fill the breach. On the whole these efforts have met with encouraging, and sometimes enduring, success. But such enterprise is in need of guidance and support, and is liable to some degree of misdirection. It lacks unity, tends to become chaotic, is without adequate supervision, and is, all too often, insufficiently related to the new knowledge and the expanding organisation.

More Effectual Organisation.

The Memorandum suggests the need for full inquiry into the educational functions of local authorities and voluntary societies with a view to their more effectual organisation.

(*a*) All local authorities are indirectly engaged in educational work inseparable from the effective discharge of their *statutory duties under the Public Health Acts*, and this aspect of their services is paramount. It is on the whole the most important and universal form of public education *in health*.

(*b*) Some local authorities, in addition, are undertaking supplementary educational work of a more direct nature, though *others* are, or deem themselves to be, debarred or at least restricted in this more direct sphere of education. It seems to me desirable that any ambiguity on this point, or *in* the law *itself*, should be removed as soon as possible, so that upon all local authorities there should be *imposed* a power or a duty of direct educational work.

(*c*) Then I think the time will have come for the Government to consider whether such educational work is of sufficient importance and value to be assisted financially by an Exchequer grant under the Ministry of Health, which would naturally take the form of a provision available to local authorities for certain approved types of educational work in hygiene.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXXXIX.

THE TREATMENT OF ANXIETY STATES.

PATHOLOGICAL anxiety occurs in many conditions, but the patients here to be considered are those where anxiety is shown as the chief characteristic—often associated with obsessional symptoms or hysteria—though this cardinal symptom is frequently masked by physical symptoms. Headache, insomnia, fainting spells, heart trouble, dysmenorrhœa, asthma, dyspepsia, mucous colitis, and the like, are found in anxiety states; the influence of emotion upon bodily functions accounts for the association, and when attention is directed to the mental state these physical manifestations can often be notably influenced.

The Avoidance of Physical Treatment.

Physical treatment need not be considered in this article, since it is obvious that the general health of the patient must be attended to and any gross lesions treated; but it should be made clear at the outset that the doctor does not regard any physical trouble as the primary cause of the mischief. Recovery depends largely upon the patient's own handling of the situation, and any emphasis upon physical troubles, though acceptable to the patient as a means of escape from facing the situation, is for that very reason to be avoided. The search for something that can be treated by physical means, with neglect of the mental state, leads to chronic invalidism. We have to avoid the extremes of regarding the patient as suffering from a physical disorder or, on the other hand, of telling him there is nothing wrong with him. He may often be led to accept the proposition that physical disease is absent if we follow it by the remark that though his physical health is good, yet there is obviously *something* the matter or he would not come for treatment.

The sympathetic elucidation of mental symptoms is the first step in treatment, and it will be found that whilst the nervous patient talks interminably about his aches and pains, he is reticent and elusive concerning his fears and inhibitions, and more obstinate still in concealing such causes for his trouble as he may be aware of. One cause for the reticence is that in the past doctors did not seek for these symptoms, and perhaps even, by dismissing them as trivial or imaginary, discouraged the patient from revealing them. Only when he realises that the mental symptoms are regarded as being in need of treatment will he talk about them; it is now recognised that there is no danger of producing mental symptoms by "suggestion," though many nervous patients readily accept and cling to a diagnosis of physical disease.

If we waited for patients to complain spontaneously about a fear of being in closed rooms we should regard claustrophobia as a text-book curiosity, and the ready acceptance of faintness in a close atmosphere as a physically induced phenomenon easily prevents understanding. General complaints of loss of memory, inability to concentrate, of depression or nervousness, are met by a request for examples. "What sort of thing makes you nervous?" will often bring out unsuspected fears and inhibitions, though it may be necessary to ask specifically about such trouble as fear of tube trains, of being in the dark, or of sitting alone in a restaurant. The feeling of being observed may be either little more serious than the shyness of adolescence, or a most distressing symptom, no less distressing because its irrational nature is fully realised by the patient. Obsessional symptoms, of which one of the commonest is the need to return several times to make sure that a door is fastened or that the gas is turned out, are themselves productive of anxiety and indicate a condition more deep-seated than the more simply handled pure anxiety state. Anxiety and obsessional symptoms are but meagrely described in our text-books, but those who realise that pathological anxiety arises from causes unknown to the patient and may remain floating loose—a fear of nothing in particular—or may attach itself irrationally to any conceivable object, soon learn from patients its manifold manifestations. Nervous breakdowns are often exacerbations of an anxiety state, and most of the cases of "neurasthenia"—even "traumatic neurasthenia"—are examples of pathological anxiety.

The Physician's Difficulties.

The minor psychoses (and under this title are grouped hysteria and anxiety and obsessional states) are generally a reaction to current difficulties; the type of psychosis is determined by the temperament of the individual and by previous troubles, and the causes—even the current ones—are not recognised as such by the patient. The commonly ascribed causes, such as overwork and stress and worry of various kinds, can only pull the trigger—they do not load the gun. The aim of treatment is to make the patient aware of his difficulties, and according to circumstances (of which the temperament of the physician is an important one) the methods range from explanation and kindly insistence up to the full technique of psycho-analysis. In any case the more the patient is encouraged to talk out his own troubles the easier will it be for him to understand himself. The mere discussion of symptoms hitherto hidden from everybody will give some relief and help to establish that *rapport* necessary for therapy. Only when this *rapport* is established can the patient be expected to bring forth such emotional difficulties as may be present. Here the temperament of the physician becomes of importance, and it must be admitted that our own resistances play a great part in hindering the patient. For example, we have in the course of our training overcome a more or less artificial resistance against accepting as a matter of fact the discussion of the anatomical details of sex, but the mental aspect of it is still subject to the social taboo. The sensitive patient will note the slightest sign of antipathy on the part of the physician and will keep back what may be essential to the understanding of his case and himself. It is a good working rule to assume that in every anxiety case there is something kept out of consciousness and that it is kept out because it is repugnant to the patient. This suppressed material is heterogeneous, but is most commonly, for obvious reasons, connected with sex. It must be accepted as an empirical observation that the bringing of the material into full consciousness, and the necessary overcoming of resistance in the process, brings relief to the patient and lessens the amount of pathological anxiety. Hence, it is plain that the physician who possesses resistances identical with those of his patient can be of little help to him and will fail to understand what he is dealing with. If he has overcome his own resistances he soon finds that in adults a minor psychosis rarely exists when the sex life is running smoothly. He hears stories of frigid wives and impotent husbands, and discovers that when one spouse comes for treatment it is often the other partner who needs it; that unhappy marriages can induce a minor psychosis, and conversely that a minor psychosis leads to unhappiness in marriage. He recognises the perniciousness of the recommendation—still frequently given—of marriage as a cure for "nerves," for anxiety often arises from fear of sex or of sex desire, and marriage in such cases leads to disaster. He may find that the patient is faced with an insoluble problem. But even then the realisation that the anxiety has served as an escape from facing the problem may help the patient. In many cases, fortunately, relief is to be found in a discussion of which they contracted the disease, after just enough treatment at a sanatorium or hospital to enable the patient to leave the institution. The patient relapses in most cases and infects his fellow workers.

Mode of Inquiry.

Information was obtained from various sources: (*a*) By questionnaires circulated to the medical superintendents of recognised sanatoriums (with attached training sections), to tuberculosis training and treatment colonies and settlements, to the branches of the Society of Medical Officers of Health, and to tuberculosis officers; (*b*) from publications of British, American, and continental authorities and committees; (*c*) from personal experience of patients at the Devon and Cornwall Training and Employment Centre and Settlement, at Papworth and Preston Colonies, at the Treloar Hospital, Alton, the Shropshire Orthopædic Hospital, the Maltings Farm Sanatorium, and elsewhere.

The replies received were without exception in favour of employment at a sanatorium with training section, afterwards at a colony or training centre, followed by agricultural or industrial occupation under medical supervision and hygienic environment—always in suitable and selected cases. In the majority of cases patients were found to improve in physical, mental, and general condition. They put on flesh, there was less cough and spit, but especially occupation helped to remove discontent, and with the prospect of becoming wage-earners patients became brighter, more reliable, and less querulous.

The replies as to the effect of employment under ordinary industrial conditions, the patients living at home, showed very variable results. There was the usual tendency to resume the old occupation, as the fullest remuneration could be earned at it. If the conditions of this were not satisfactory and if patients could not regulate their life according to their state of health, relapses were common. On the other hand, if the conditions of work were satisfactory or fairly so, and the factors producing the disease (such as bad home surroundings) were improved, the general health might be maintained. As long as the health continued fairly good, the ability to support themselves and their families resulted in a contented mind and removed the worry, which had such a depressing effect on a willing individual. Mental health and outlook usually improved with employment, although physical relapse frequently occurred, especially if the housing was bad.

Care and After-Care.

The replies showed that care and after-care were necessary and should be continuous; that when thoroughly carried out such care was of therapeutic value and of economic assistance to the patient and to the community; that care should be organised both (*a*) as to the character and methods of training and employment, (*b*) as to the financial assistance in such schemes, and (*c*) in the maintenance of the patient and his family by the State and the local authority with real voluntary helpers. The State should approve, define, and forward the scheme, the duty being laid upon the local authority to work it out by a combination of agencies.

The housing of patients while training should be in colonies or village settlements—i.e., after sanatorium treatment and training, and also when permanently employed, if their physical condition indicated the continued need for such a life. For those who returned to their homes and were employed under supervision in work-rooms or allotments, or under ordinary industrial conditions in the vicinity of their homes, suitable housing should be provided, controlled, supervised, or improved, if necessary, by the local authority.

My personal experience is that there are numbers of patients whose future existence depends on suitable employment under medical supervision in healthy conditions, *after* adequate treatment (with or without training) at a sanatorium, and on continuous care and after-care. No training centre, colony, or workshop should be approved or established except under medical supervision and control. Such centres should be regarded as commercial sanatoriums for sick men, not as business propositions; if run as such they will be dismal failures. Unsuitable or unregulated work undertaken, when treatment by rest or graduated exercise in a sanatorium is indicated, is a danger. There are definite medical contra-indications to work. Suitable temperament is essential to success as a trainee or colonist, and the "work-shy" civilian or ex-Service tuberculous patient is useless for employment. With a number of ex-Service pensioners for tuberculosis the award of 100 per cent. pension (whether the disease is active or not) results in disinclination towards useful work of any kind. For years these men have done no work, partly because there has been no need or call to do so; some are young, others middle-aged. The civilian has the habit and need to work, in him the *inclination* exists, and he makes a suitable trainee or colonist.

I have no doubt that the State and local authority, assisted by local voluntary agencies, should organise and finance complete schemes of care and after-care. It cannot safely be left to voluntary agencies, which have not as a rule the knowledge, enterprise, or money to get things done. *They talk much and often do little.* On the other hand, the local authority may not have the vision, and acts only under compulsory, not permissive, legislation. The right spirit must animate both State and local authority. Given initiative, together with the resources of the State, success will be sure.

Conclusions.

1. Adequate treatment for both pulmonary and non-pulmonary tuberculosis in sanatorium or hospital must precede employment in all cases—viz., convalescent after active disease, quiescent or chronic and incurable.
2. Employment is good, both physically and mentally, if the patient is fit for work and the work is prescribed in regulated "doses" under medical supervision.
3. The constant medical supervision of a complete care and after-care organisation prevents the spread of tuberculosis and lessens the sickness-rate of the disease.
4. A complete care and after-care scheme, affording training and remunerative employment, is of economic value both to the patient and the community, and lessens the financial burden to the nation.
5. Provision should be made by the State and by the local authority for training sections or "extensions" for men, women, and children at sanatoriums and hospitals, such patients to be selected on medical grounds.
6. Provision should also be made for training and treatment centres and village settlements for temporary or permanent residents under medical supervision.
7. Industrial and agricultural training and employment should be available at such centres.
8. Workshops should be provided in such centres and for urban districts under medical supervision.
9. The State and the local authority should organise such centres, assisting financially the patient and his family to exist during incapacity, partial or complete.
10. Voluntary agencies should assist in such schemes as (5) and (8).
11. *Housing.*—Patients while training in sanatoriums or residential settlements, and after training during employment, should be housed at such centres, as long as their physical state indicates the need. Those who have returned to their homes and are employed either in municipal or approved workshops or allotments, or under ordinary industrial conditions, should receive the assistance, supervision, and control of the State and local authority in housing when their home circumstances require this.

Recommendations.

I submit that there is need of inquiry and action by the Government, either by a Departmental or Inter-Departmental Committee, or by inclusion in the proposed Royal Commission on the Medical and Allied Services under the National Insurance Act. Need for organisation arises because there is an incomplete and, therefore, wasteful medical tuberculosis service, defective in its principles and in its complete medical care of patients. Inquiry by Departmental Committees in 1912, 1913, and 1919 approved occupational training in sanatoriums, training colonies, and village settlements, the last for ex-Service men only. The responsibility for establishment and maintenance for these institutions was placed on the Ministry of Health and £1,250,000 was proposed to finance these developments, which did not materialise. The demand now is for an inquiry into the extent of and solution of the problem on a national basis and including the whole civilian population.

The number of patients for whom *accommodation* is required in training centres, or in colonies or settlements, should be ascertained, with due consideration to the fact that the numbers will always be limited under a voluntary system and subject to selection on medical and other grounds. The number of *such centres, settlements,* and workshops should be estimated. The capital and maintenance cost should be arrived at. Allowance should be made for the saving in Poor-law and other forms of State relief and incapacity for remunerative industrial employment *owing to disablement* under the present lack of system.

It is futile to place responsibility for housing and after-care on tuberculosis medical officers and on after-care committees. The bogey of expense for these measures will disappear if the problem is boldly faced on the basis of facts and knowledge of their comparative cost with those of disablement and sickness.

Points for a Government Inquiry.

Put briefly, there are three points which show the necessity for a Government inquiry. (1) The tuberculosis medical service as it exists is incomplete and (*d*) Lastly, these two steps in re-defining the powers under which educational work is undertaken by a local authority, and encouraging its development, will inevitably raise the question of the extent to which, and the terms on which, voluntary societies should also officially participate in the more direct form of such instruction (as distinct from the indirect educational work inherent in an efficient sanitary service). On this subject it would not be appropriate for me here to say more than that, in my opinion, it is the local authorities who must be directly responsible for undertaking educational health work, direct as well as indirect, suitable to their own district, circumstances and needs, with such supplementary special assistance as the voluntary societies concerned may find themselves able to afford.

Supplementary Teaching.

Among the principal direct methods for providing supplementary teaching the Memorandum suggests the following: (1) The publication of annual reports, bulletins, pamphlets, leaflets, circulars, posters, &c.; (2) the preparation of special articles for the newspaper press; (3) lectures and addresses, educational classes and conferences; (4) the construction and display of exhibitions and demonstrations; (5) the use of the cinema; (6) broadcasting. In a footnote Sir George Newman adds the following interesting hints and suggestions as to details of procedure. That the method is capable of considerable development is obvious from the extent to which it is profitably utilised in similar publications for the purposes of commercial publicity. Those responsible for drafting and publishing such documents might with advantage draw on the knowledge and experience of commercial advertisers, and have regard to the technique of printing, letterpress, and display.

Annual reports should be clear and simple, and supply reliable statistics as to the work done and the needs and direction of future expansion. The weekly, monthly or quarterly health bulletin or journal has been widely used in America and Canada. It should be interesting and informing, and designed to keep teachers and instructors in touch with local public health questions.

Pamphlets and leaflets are used for purely instructional purposes in special subjects, being given to those who definitely seek the information at clinics or elsewhere. For this purpose they are undoubtedly of great value, although their application is of necessity limited to those in whom the health conscience has already been aroused.

Posters should be brief, graphic, and arresting as well as accurate.

The *Newspaper Press* inserts health articles to a certain extent in this country, but much more in America. Press matter consists of (*a*) "Copy" and (*b*) Advertisements. Copy is presented in several sub-divisions each of which can, to some extent, be used for purposes of health propaganda. *Editorial comment* is written to the order of the editor and deals only with subjects of paramount or current interest. It is only very occasionally, therefore, that it would be available in any organised scheme of propaganda. The "*news*" *story* is an expression used to denote copy which informs the reader in narrative form of any recent occurrence. Matter of this description may sometimes be made to point a sanitary lesson or introduce an item of health teaching, and "interviews" may thus be a vehicle for health propaganda. The "*feature*" *story* is a periodical article on various subjects such as music, fashion, art, &c., and many of them include information on health. It is the form not infrequently adopted for health teaching in newspapers in this country, and most editors are willing to accept it if attractively written and not too technical. The correspondence columns of newspapers, sometimes with the encouragement of the editor, are often deliberately employed for arousing interest and discussion, or even controversy, on subjects about which it is desired to make people think. Health subjects have been dealt with in this manner, and it is a device that should be borne in mind by the propagandist. Many newspaper advertisements such as those of soaps, dentifrices, toilet preparations, foods, and even patent medicines are framed in a manner calculated to arouse a desire for health that would be most valuable were they always employed for advocating sound hygiene.

Lectures, lessons, educational classes and conferences fall naturally into two groups, those forming part of the curriculum of schools or educational institutes and those delivered to audiences specially assembled for the purpose. Both groups may afford most valuable means for imparting instruction to those who desire it. The subjects should be appropriate, well presented, and amply illustrated by charts, lantern slides, or films. Originality and initiative are generally rewarded, and exhibitions and demonstrations have proved extremely successful.

The *cinema* has exceptional potentialities as a medium for public health propaganda. Practically all lasting impressions on the human mind are absorbed most readily through the visual or auditory senses, and of these two vision plays the greater part. The strength of the impression produced will depend very largely on the extent of the interest aroused at the time. In view of the remarkable development of the art of film production in the last 20 years, it is disappointing that it has not been more fully used for purposes of popular health education, but there are many difficulties, including expense, the taste of the audience, eye-strain, methods of projection, and inflammability. In American public health circles the opinion is expressed that the results of cinema methods have not come up to expectations. In order that a health film should fulfil its object it must be capable of reaching a large number by its popular appeal and of conveying its lesson correctly. The first is the business of the film producer, the second of the health specialist. These two experts have not hitherto combined effectively, with the result that in the majority of health films at present existing either the health instruction is ludicrous in its inaccuracy, besides being completely overshadowed by the dramatic effect of the film, or else the film is so packed with highly technical instruction that it fails to make a popular appeal. The cost of producing films is high, especially if only a small number of copies are prepared.

Broadcasting has shown remarkable development in the past 12 months and seems likely to continue to do so. As a means of publicity it already bids fair to equal or surpass other methods. At present its use for health propaganda, in this country at any rate, has scarcely begun, but there can be no doubt that it holds out immense possibilities in this direction. Already upwards of 800,000 listening-in sets are licensed, and as each set is capable of being used by a number of listeners simultaneously, the "circulation" of broadcasting is very large. The British Broadcasting Company has to provide for the taste of its listeners quite as much as, if not more than, the newspaper for that of its readers. Like the newspaper, therefore, it accepts matter that will please and interest its patrons and it naturally will not accept "copy" that will tempt listeners to remove their head-phones.

Sound Educational Method.

Those who would teach large masses of people the way to health must make a careful study of method. There is a problem: it must be expressed simply, clearly, graphically, and accurately; it must be steadily and moderately driven home, so that every person feels it. There is a solution: and the way out must be demonstrated in such form that the action of the individual and the community is secured. In a word, to achieve any lasting effect sound educational methods must be followed. The publicist must be a teacher, trustworthy in fact, comprehensive in conception and understanding, able to impart the knowledge which he possesses, and capable of drawing out his pupils.

A REPORT ON THE EMPLOYMENT AND AFTER-CARE OF TUBERCULOUS PERSONS.

BY F. G. BUSHNELL, M.D., B.S. LOND., D.P.H.,
TUBERCULOSIS MEDICAL OFFICER, PLYMOUTH BOROUGH COUNCIL.

THE following report was drawn up at the request of the Advisory Committee (Public Health) of the Trades Union Congress and Labour Party, the inquiry being carried out in conjunction with the West of England Branch of the Society of Medical Officers of Health. A thorough and complete system of care and after-care of tuberculous persons includes the training and employment for suitable work of selected patients who may be unable to resume their own occupation after sanatorium treatment owing to the danger of relapse; their settlement and housing; their maintenance and support of their families; their general advice and assistance; and the considerations which arise therefrom. It is felt that an end should be put to the present inhuman system of allowing persons suffering from tuberculosis to return to the conditions under

Correspondence.

"Audi alteram partem."

TUBERCULOSIS AND THE FEEDING OF COWS.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of Sept. 20th on milk production only proves conclusively that the Milk Publicity Council is faced with a colossal piece of work, and to anyone who has interested himself in the question of milk infection with tuberculosis the position seems to be almost impossible to deal with. The whole root of the evil is that everyone is trying to treat a symptom instead of dealing with the direct cause, and until the cause is dealt with there is but very little hope that we shall ever have milk that is free from tubercle.

I have gone into the matter fairly completely and have experimented largely on the possibilities of preventing tuberculosis by hygienic methods, such as cleanliness, open air, exercise, &c., and have come to the conclusion that, good as these measures may be, they have very little influence on prevention of tuberculosis in our farm stock. I have seen tubercle amongst cattle in farm stock on farms which are run under the most hygienic conditions possible, but, nevertheless, a large number of the cows reacted to the tuberculin test. I have also visited farms where conditions have been far from perfect as regards hygiene, yet there were very few reactors. On certain farms where certified milk is being produced, I was informed that cows were constantly being discarded because they reacted and, of course, this discarding would be continuous. I found that these reacting cows were disposed of either in the local market or to another farm where certified milk was not produced. I have recently had several cows tested with a view to purchase, and not 2 per cent. but 20 per cent. failed to pass the test. There are many more tuberculous cows amongst dairy herds than one would suppose and these are not discovered until a test is carried out. We, as a profession, perhaps do not realise that one cow in a herd, say, of 100, is quite sufficient to infect the whole of the milk from the other 99 cows. The same churns, buckets, and often the same milker are used for all, and were we to slaughter all the reacting cows in Great Britain to-day the results within a few months would be just as bad. One has only to go into the question of modern day feeding of a dairy cow to realise the cause of this prevalence of tuberculosis amongst dairy cows. My experiments have been carried out chiefly on pigs, for, as we are well aware, the pig is as susceptible to bovine tubercle as is the human being. Some years ago I founded a herd of pedigree pigs and housed and bred them on the open-air system. I was constantly slaughtering animals which on post-mortem examination showed marked signs of active tuberculosis.

The percentage was often as high as 5 per cent. of animals showing pathological lesions either in the form of glandular enlargement, pulmonary tubercle or pleural effusion, or adhesions. This worried me greatly, and I considered whether it was possible to effect a cure by isolation of the dams from which those pigs had been born. I slaughtered all the mothers of any pigs that showed any signs of tuberculosis, and yet this did not cure the condition. A few years later the work on vitamins by several well-known pathologists was published, and I immediately set to work on these lines, with the result that I eliminated tuberculosis entirely from one of the largest herds of pigs, numbering well over a thousand. It is indeed a rare occurrence now to find any tubercular lesions in any of my stock. I breed some 2000 animals a year, and I have the advantage of examining some 30 carcasses a week. When one considers the natural life-history of the pig it is not indeed surprising to find tuberculosis so common amongst our farm stock. The pig normally, like the cow, will give birth to its offspring in the spring of the year, when there are trees budding, grass is growing, and where there is a good supply of vitamins in its natural foods. As the result of breeding we are now expecting our animals to give birth to their offspring at unnatural periods of the year. Furthermore, the cow was never intended by nature to supply milk for human beings, and it is indeed interesting to notice what takes place with cow and calf during the spring months. Should the calf be born about April or May, and be allowed to run with its mother in its natural state, the calf will wean itself when about 4 months old, and the cow will become "dry." She would then store up sufficient vitamin A for her general health and for her next calf. But just consider what is nowadays done. As soon as a cow has calved, may be in July or August or even in November or December, the calf is taken away from her and the cow is then milked for nine or ten months, its milk supply being stimulated by such foods as cokernut cake, palm kernel cake, cotton-seed cake, &c., none of which contain, in my opinion, any vitamin content. I carried out some experiments with these three cakes, by feeding them to pigs, giving them an adequate quantity of carbohydrate, albuminoid, oil, mineral salts, and water, yet my animals immediately began to go down hill and showed marked signs of disease, proving that none of these cakes contained the food accessories. On the other hand, when I supplied foods that were rich in the vitamins A, B, and C there was an immediate marked improvement. Just consider to-day what is the ordinary milk record over a period of 12 months of a good dairy cow; 1000 gallons is quite common, even 2000 to 3000 gallons may be produced during the lactation period, and yet this quantity is maintained chiefly by foods devoid of vitamins. Here lies the cause of the whole trouble, and I predict that unless some radical change is made in our feeding methods milk as a source of sound food for human beings, especially children, will be impossible. I have been able to trace a large amount of tuberculosis in pigs to by-products from cheese and milk factories on which they were experimentally fed. Our continental competitors, especially in Germany and Denmark, make it a criminal offence to feed to farm stock even the washings from cream separators unless they have been sterilised, and it is indeed strange that up to the present our agricultural colleges and our biochemists have not taken the matter up from the pathologist's point of view—namely, that the trouble is not so much due to infection and unhygienic conditions as to the lowered resistance of the dairy cow to tuberculosis as the results of unnatural feeding.—I am, Sir, yours faithfully,

M. J. ROWLANDS, M.D.

Southwood Farm, Westerham Hill, Kent,
Sept. 20th, 1924.

FUNDAMENTAL CANCER KNOWLEDGE.

To the Editor of THE LANCET.

SIR,—In the leading article with this title in your issue of August 9th you show that, as a result of many years of arduous research, a foundation for the hoped-for superstructure has been laid. There is, however, a missing stone. Work on this problem was started at a period when the connexion between preventive medicine, mobile laboratories, and stationary investigation laboratories was but little recognised. Thus research was commenced and has been continued by the pathologist, aided by clinical observation and ever-increasing biochemical knowledge. In the present day, were a new disease to attract attention, concerning the nature of which various observers differed in details but were on common ground in asserting that (1) it appeared at a certain period of life, (2) was apt to be found (*a*) in users of special diets, (*b*) in successive inhabitants of certain houses, (*c*) in places haunted by rodents and wasteful, and itself in need of first-aid. (2) A system that leaves the treatment of the mass of tuberculous persons at the stage where the patient returns to almost certain relapse and spread of infection to others, is unsound and even inhuman. (3) We cannot wait, as some would have us do, for general hygienic, social and economic improvements to suppress the disease but make a direct frontal attack on its infectivity.

I believe I have made out a case for inquiry, when further data can be obtained and details worked out.

UNIVERSITY OF LONDON BY-ELECTION.

NOMINATIONS for the seat left vacant by the death of Sir Sydney Russell-Wells must be received by the returning officer before 11 A.M. on Oct. 1st. Polling takes place from Oct. 13th to 17th by voting papers sent to all graduates on the Parliamentary Register. At present three candidates are known to be standing.

Sir **JOHN ROSE BRADFORD**, official Conservative candidate, has been closely associated with the University and its work for over 40 years as a member of the Senate, an examiner for the University, and until recently a teacher in one of the medical schools. He was at one time secretary of the Royal Society, and he served throughout the war as consulting physician to the British Expeditionary Force in France. He stands for: (1) the maintenance of external degrees in all faculties; (2) a Senate on which graduates and teachers are fully represented: (3) freedom of the University from State control; (4) development of the full resources of the University both on its internal and external sides; (5) the maintenance of the degrees of the University at their undisputed standard; (6) the improvement of the status and responsibility of the teacher; (7) the maintenance and increase of all facilities for the progress of boys and girls from school to the University. In order to carry out these aims he regards it as essential that the Governing Body or Senate should be of a representative character and contain representatives in adequate numbers of the teachers and of the graduates. He is opposed to the conception of a nominated Senate, or to any policy that would restrict the present share of representation of graduates and teachers on the Governing Body. He is opposed to the appointment of any statutory commission, more especially if empowered to carry out recommendations that would result in giving the University a nominated as opposed to a representative Senate, or in restricting the proportionate representation of teachers and graduates. Should Mr. Trevelyan carry out his intention of appointing a departmental committee to consider and report on the development of the University, he would exert his influence to see that all aspects were fully considered. Such changes as may be needed would, he believes, affect in the main the internal side of the University. He would support and advocate means by which the University may render greater assistance than it does at present to the student who, because of want of means or other hindrance, cannot obtain teaching in London or elsewhere. The two sides of the University must, he states, be fully developed if it is to play its proper part as an Imperial and as a metropolitan university. He is not pledged to any site for the University.

Dr. **E. GRAHAM LITTLE** is standing as a Non-Political candidate with the support of the Graduates' Association, which has consistently fought the recommendations of the Haldane Commission. Having had 18 years' experience of the administrative work of the University as member of the Senate, he considers that sufficient time has not yet been allowed for testing the quality and permanence of the Dual Constitution imposed in 1900. Left to themselves the two sides of the University could readily come to an agreed decision. If elected he means to fight for certain principles threatened by the Haldane Report—namely, (1) freedom of the University from bureaucratic control; (2) government of the University by its graduates and teachers; (3) maintenance of external degrees; (4) preserving the present relations between the secondary schools and the University; (5) free and harmonious development of both sides of the University and the continuous expansion of the field of its activities; (6) conservation of the standard of the degrees, and of the central control by the University of degree-giving examinations. As chairman of the Council for External Students he clings to the uniquely Imperial character and functions of the University as the only one whose examinations can be taken in all parts of the Empire. He will oppose any change that would lower the historic standard, not only in justice to those who have obtained the earlier degrees, but because of the damage to prestige. He would exact the fullest consultation of the faculty concerned before any action affecting that faculty is taken by the Senate. He desires to see the University continuing to provide, as it has done throughout its past, the best educational opportunities for the largest number of people.

Prof. **A. F. POLLARD**, who is standing as Liberal candidate, is the founder of the Institute of Historical Research, open to all graduates duly qualified, whether internal or external; and was chairman of the Board of Studies in History when it successfully recommended the Senate to establish there a special adviser to external students. The University, like all living and growing organisms, may need modification and greater elasticity to adapt itself to expanding needs and fresh responsibilities, but all schismatic proposals to separate the internal from the external side or research from teaching seem to him fraught with disaster. The latest and momentous developments of the University have been achieved by hearty coöperation between representatives of different interests. The old examining side of the University, he feels, did invaluable work in nursing the newer universities into existence before any one of them was strong enough to stand on its own feet. There will, he is sure, long continue to be growing centres of education looking to London for a means and a standard of examination, as well as individual students outside the area of any university or university college who would be debarred from a degree but for the University of London. At the same time, the ultimate aim of a university is to provide a university education, and the existence of 10 millions of people within the area of the University of London imposes upon it an enormous responsibility. It is not merely or mainly a question of examinations and degrees; it is, Prof. Pollard holds, an exploded anachronism to think that a university has only to teach the young. There are hundreds of thousands of adults capable and desirous of profiting by the information and inspiration which only a university can provide. He regards it as the prime duty of the University to keep in touch with those who have taken its degrees and to get into touch with those who have not, but who live within its sphere of influence and wish to avail themselves of its facilities.

MANCHESTER ROYAL INFIRMARY.—Post-graduate lectures will be given this year on the same lines as those given during the past few years. Till Christmas these will be given twice weekly, on Tuesdays and Fridays at 4.15 P.M. All medical men are cordially invited to attend. During the last two years four professors at the Manchester University closely connected with the teaching of medical students—viz., Profs. J. S. B. Stopford, H. S. Raper, R. B. Wild, and W. H. Bragg—have been appointed respectively honorary advisory anatomist, physiologist, pharmacologist, and physicist to the Royal Infirmary. This step has helped to bring the University and the Royal Infirmary, the two largest constituents of the medical school, more closely in touch. Three of these professors (Prof. Bragg is still in America) are joining in the Friday post-graduate lectures, which are generally more scientific in type than those given on Tuesdays. On Oct. 7th, instead of the usual lecture, Sir John Bland-Sutton will give the Lloyd Roberts lecture, and has chosen the subject of Attic Salt for Gall-stones. It has been decided in Manchester, as in London, to give only one Lloyd Roberts lecture yearly. This year it will be at the Royal Infirmary, next year at the St. Mary's Hospitals.

examination of their microscopic structure. But there are great difficulties still to be overcome. I have myself been studying the gross and microscopic appearances of tumours for the past 40 years. Yet I often meet with a microscopic section which to my knowledge does not fall into any of the routine groups. After a period of speculation and research I am sometimes able to recognise its true nature by comparison with a similar specimen in my collection. At other times the nebulous picture of a similar specimen seen somewhere years before will not materialise and I am left in uncertainty. In the museum all the specimens would be catalogued and classified in such a manner that anyone could rapidly pick out that case which corresponded with the one under review.

The following case—one of many—is typical of the difficulties which I have observed in my own professional experience:—Tumour of forearm: (1) Report by E. H. S., "the Tumour is a lymphadenoma and is malignant"; (2) report by Dr. B., "Fibrosarcoma, possesses local malignancy not recurring after adequate removal"; (3) report of Mr. C., "Lymphangioma. No malignant transformation has occurred." The surgeon who removed the tumour was thus left to ponder the above reports, clearly at variance.

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The only objection raised is that of finance. Many physicians and surgeons have expressed interest in this scheme, but all point out that the proposed museum would cost a lot of money. How can this money be obtained? The medical profession cannot afford it. The State is already overburdened. We must look elsewhere and hope that some generous individual will come forward and found an institution which would fill a great need.

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To the Editor of THE LANCET.

SIR,—In connexion with your leading article of August 28th on Rheumatic Affections in Children, you kindly refer to one portion of the attempt which is being made to deal with this problem in Birmingham: perhaps I may be allowed to draw attention to other work of a similar character which is being carried out by the City of Birmingham Education Committee through its Special Schools Department, which is mentioned in another portion of the annual report from which you quote. Baskerville House Residential School for Physically Defective Children has 47 beds, the majority of which are devoted to children who suffer from rheumatic affections and intractable chorea. During the past three years just over 100 children have been in residence under observation for an average period of six months. Dr. A. P. Thomson, Special Schools Medical Officer, writes:—

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In addition to the above, an attempt is being made, in connexion with a committee of the British Medical Association, to study the geographical and seasonal distribution of rheumatic affections. The names of all children who are reported as unable to attend school on this account by private practitioners, school medical officers and school nurses, school attendance officers and health visitors, are collated and, as far as possible, investigated. In this way it is hoped that material of real value towards the elucidation of ætiology, treatment, and educational procedure will be forthcoming.

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> "Cases of goitre were met with throughout our route across Abyssinia, but were much more common in the western than in the eastern part. The cases were usually of a parenchymatous type, but adenomatous and other forms were met with, and Graves's disease seemed far from rare. All the cases of goitre that I saw were in the plateau itself, and I saw none in the low country forming the valley of the Sobat and Baro rivers, which are inhabited by Negro tribes of quite different race to the Gallas and Abyssinians of the high country."

Possibly Prof. Dolbey and Dr. Omar had in mind only the low country to which Dr. Singer refers, as this is the part traversed by the Sobat and Baro, which are large and important tributaries of the White Nile. It should, however, be noted that goitre does occur, and is indeed common in the South-Western portions of Abyssinia. Whether the disease is also met with on the northern part bordering on Lake Tsana, the source of the Blue Nile, I am unable to say.

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WORTHING HOSPITAL, SUSSEX.—This excellently managed hospital is one of 46 beds: the governors are hoping in the near future to bring that number up to 100. In the spring of last year a new wing was opened providing for maternity and paying patients, but still the provision is inadequate. Thanks to the balance in hand of £666 at the end of the last financial year and the receipt since Jan. 1st last of £2700 in legacies and life governors' subscriptions, the governors at their meeting decided to proceed at once with a scheme for the rebuilding of the administrative departments and the reconstruction of the heating and hot-water systems, at a cost in round figures of £5000. The difference between the sums of £2700 and £5000 is to be taken from capital as required. Land immediately to the north of the new maternity wing is to be utilised for the purposes of the new departments, and the plans have been so prepared that the new works may harmonise with the still larger developments which are in contemplation. In the present scheme the most pressing need is the reconstruction of the domestic offices: while in the past considerable difficulty has been experienced in keeping the institution warm. The first buildings of the present hospital were opened in 1881, but it was in 1829 that hospital work was begun in the town in two rooms.

their concomitant food and parasites, (*d*) in human subjects of helminthism, (*e*) in persons following occupations involving contact with chemicals—field work probably would (and certainly should) be the first effort towards disentanglement of reputed factors.

An area where prevalence of the disease was on the increase having been selected, a house-to-house inquiry by the sanitarian, aided by experts in the various sciences dealing with life factors, as influenced by the environment of man and beast, would be conducted. This would embrace in detail the history, in reference to these factors, of both the healthy and the diseased in each house within the selected area. The toil would be great, but would be trivial compared with the 24 years' research by pathologists thus unaided in the quest of truth. The British Empire Cancer Campaign has recently set up committees for statistical and economic research into the causation of cancer. What I should like to see would be carefully recorded details (say) of a thousand households devoid of effort to support a particular theory, which would afford, on concentration, a mathematical basis on which to apportion the guilt of suspect causative agents. Such a method led Sir Ronald Ross, 25 years ago, to put aside hypothesis in malaria research and confine labour to immediate factors. An inquiry of this kind would be hopelessly handicapped in Great Britain, where the analogues of Hindu caste and the American Munroe doctrines guard the Englishman's home. But in tropical and subtropical countries there are known to be cancer-affected and, possibly, cancer-free areas where indigenous races less likely to resent intimate inquiries are to be found—as shown by the success of the Rockefeller anti-hookworm campaign. The funds now available for cancer research would not be unduly depleted by outlay on "expeditions," for pursuit of this practically untouched branch of an important subject.—I am, Sir, yours faithfully,

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What is needed at the present day is a Journal of Mechano-Therapeutics which would publish original articles and reviews of current literature on all branches of the movement cure, such as massage proper, vibration, passive and active movements of joints, "manipulative surgery," "remedial exercises," "spondylotherapy," and all portions of educational gymnastics and physical drill that have for their object the prevention or cure of disease or which are the foundation of therapeutic movements. The appearance of such a journal would supply a long-felt want, and be welcomed by the medical men interested in these methods whose number increases year by year, and I see no reason why England should leave it to the foreigner to take the first step.—I am, Sir, yours faithfully,

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Briefly the scheme is as follows:—

1. A building in a central position, such as the Museum of the Royal College of Surgeons of England.
2. A governing body composed of, say, representatives of the various Colleges and Universities. (To include surgeons, physicians, pathologists, &c.)
3. An executive staff of medical men: (*a*) a pathologist (the head of the Institute) and possibly an assistant pathologist; (*b*) bacteriologist; (*c*) embryologist; (*d*) comparative anatomist, perhaps also a chemist and others.
4. Working staff to do section cutting, mounting, specimen and clerical work; artists and photographers should be included. This organisation and staff would be responsible for the important work of the institution itself, but there would remain the problem of relating the work of the museum to the practice of the surgeon in every part of the country. The actual practical results to be secured from it would be so immediate, the knowledge to be gained so far-reaching, that much could be accomplished towards compiling what I may term a finger-print system of malignant disease comparisons.

To ensure that such an institution would be supplied with suitable and adequate material the coöperation of practitioners and medical schools throughout the country would be required. For this purpose I would propose the appointment of agents or scouts, in connexion with the medical schools. The inducement I would present would be the offer of a certain number of scholarships to young people desirous of taking up the career of pathology. In this way two valuable purposes would be secured: (1) Students would be constantly on the watch for material obtained, as it were, at first hand with which to supply the centre. (2) They would be gaining valuable experience and the ranks of first-class morbid anatomists would be strengthened.

Yet a further advantage discloses itself. The sum of human knowledge would be considerably added to if in certain classes of tumour the after-history of patients could be carefully noted and compared. The authorities of the museum would be charged to give immediate notice of any such cases which came to their notice, and to supply forms for, and details of, the information which they required. I believe there are very few practitioners in this country who would not readily collaborate in such work; especially where, as I am perfectly assured would very quickly be the case, the national pathological museum began to give practical demonstration of its work.

The results of the work carried on by the staff of the museum would be made known to the profession through the usual channels, and, in addition, its activities might well include the publication, from time to time, of an Atlas of Pathology. Thus eventually we should secure a standard by means of which the tumours of every class could be at once recognised and properly placed, and a correct diagnosis and prognosis given.

The need which exists for the formation of such a museum, and the results which would accrue from it, require only brief statement at present. The great majority of tumours found at operation are easily placed in their right category on

examination of their microscopic structure. But there are great difficulties still to be overcome. I have myself been studying the gross and microscopic appearances of tumours for the past 40 years. Yet I often meet with a microscopic section which to my knowledge does not fall into any of the routine groups. After a period of speculation and research I am sometimes able to recognise its true nature by comparison with a similar specimen in my collection. At other times the nebulous picture of a similar specimen seen somewhere years before will not materialise and I am left in uncertainty. In the museum all the specimens would be catalogued and classified in such a manner that anyone could rapidly pick out that case which corresponded with the one under review.

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1. A building in a central position, such as the Museum of the Royal College of Surgeons of England.
2. A governing body composed of, say, representatives of the various Colleges and Universities. (To include surgeons, physicians, pathologists, &c.)
3. An executive staff of medical men: (*a*) a pathologist (the head of the Institute) and possibly an assistant pathologist; (*b*) bacteriologist; (*c*) embryologist; (*d*) comparative anatomist, perhaps also a chemist and others.
4. Working staff to do section cutting, mounting, specimen and clerical work; artists and photographers should be included. This organisation and staff would be responsible for the important work of the institution itself, but there would remain the problem of relating the work of the museum to the practice of the surgeon in every part of the country. The actual practical results to be secured from it would be so immediate, the knowledge to be gained so far-reaching, that much could be accomplished towards compiling what I may term a finger-print system of malignant disease comparisons.

To ensure that such an institution would be supplied with suitable and adequate material the coöperation of practitioners and medical schools throughout the country would be required. For this purpose I would propose the appointment of agents or scouts, in connexion with the medical schools. The inducement I would present would be the offer of a certain number of scholarships to young people desirous of taking up the career of pathology. In this way two valuable purposes would be secured: (1) Students would be constantly on the watch for material obtained, as it were, at first hand with which to supply the centre. (2) They would be gaining valuable experience and the ranks of first-class morbid anatomists would be strengthened.

Yet a further advantage discloses itself. The sum of human knowledge would be considerably added to if in certain classes of tumour the after-history of patients could be carefully noted and compared. The authorities of the museum would be charged to give immediate notice of any such cases which came to their notice, and to supply forms for, and details of, the information which they required. I believe there are very few practitioners in this country who would not readily collaborate in such work; especially where, as I am perfectly assured would very quickly be the case, the national pathological museum began to give practical demonstration of its work.

The results of the work carried on by the staff of the museum would be made known to the profession through the usual channels, and, in addition, its activities might well include the publication, from time to time, of an Atlas of Pathology. Thus eventually we should secure a standard by means of which the tumours of every class could be at once recognised and properly placed, and a correct diagnosis and prognosis given.

The need which exists for the formation of such a museum, and the results which would accrue from it, require only brief statement at present. The great majority of tumours found at operation are easily placed in their right category on

examination of their microscopic structure. But there are great difficulties still to be overcome. I have myself been studying the gross and microscopic appearances of tumours for the past 40 years. Yet I often meet with a microscopic section which to my knowledge does not fall into any of the routine groups. After a period of speculation and research I am sometimes able to recognise its true nature by comparison with a similar specimen in my collection. At other times the nebulous picture of a similar specimen seen somewhere years before will not materialise and I am left in uncertainty. In the museum all the specimens would be catalogued and classified in such a manner that anyone could rapidly pick out that case which corresponded with the one under review.

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[1] THE LANCET, 1923, i., 218.

The following case—one of many—is typical of the difficulties which I have observed in my own professional experience:—Tumour of forearm: (1) Report by E. H. S., "the Tumour is a lymphadenoma and is malignant"; (2) report by Dr. B., "Fibrosarcoma, possesses local malignancy not recurring after adequate removal"; (3) report of Mr. C., "Lymphangioma. No malignant transformation has occurred." The surgeon who removed the tumour was thus left to ponder the above reports, clearly at variance.

Two more outstanding advantages of a National Pathology Museum declare themselves: (1) The provision of more and better-trained pathologists (by reason of the fact that students will find knowledge ready to their hands instead of requiring years of experience to acquire); and (2) the centralising and rendering permanent of the vast stores of information and experience which pathologists up and down the country have gained and much of which will eventually die with them unless some means such as this is devised for its preservation.

The only objection raised is that of finance. Many physicians and surgeons have expressed interest in this scheme, but all point out that the proposed museum would cost a lot of money. How can this money be obtained? The medical profession cannot afford it. The State is already overburdened. We must look elsewhere and hope that some generous individual will come forward and found an institution which would fill a great need.

I am, Sir, yours faithfully,

ERNEST H. SHAW, M.R.C.P. Lond.

Royal Northern Hospital, London, N.,
Sept. 20th, 1924.

PROVISION FOR RHEUMATIC CHILDREN IN BIRMINGHAM.

To the Editor of THE LANCET.

SIR,—In connexion with your leading article of August 28th on Rheumatic Affections in Children, you kindly refer to one portion of the attempt which is being made to deal with this problem in Birmingham; perhaps I may be allowed to draw attention to other work of a similar character which is being carried out by the City of Birmingham Education Committee through its Special Schools Department, which is mentioned in another portion of the annual report from which you quote. Baskerville House Residential School for Physically Defective Children has 47 beds, the majority of which are devoted to children who suffer from rheumatic affections and intractable chorea. During the past three years just over 100 children have been in residence under observation for an average period of six months. Dr. A. P. Thomson, Special Schools Medical Officer, writes:—

> "The majority of the children in Baskerville have some form of rheumatic disease. Sufficient time has hardly elapsed to enable me to speak definitely of the results, but the first re-examination of children who had left the school six months or more previously was very promising; most of them had been in good health and in regular attendance at an elementary school, whereas before their admission they had either been entirely absent from school for some years or had attended only sporadically. I wish to point out that we find at Baskerville that suitably controlled educational methods are a very valuable adjunct in the treatment of rheumatic (and especially choreic) children.
>
> "During the year I have been endeavouring to discover tests by the use of which it would be possible to be sure that a child had become safe from the danger of rheumatic relapse or the further progress of disease of the heart. . . .
>
> "We found that as a whole the children did not do well during the winter term and we thought it possible that the absence of sunlight *might* be of importance in predisposing to relapse. We propose to use an ultra-violet lamp in the future during the sunless periods."

In addition to the above, an attempt is being made, in connexion with a committee of the British Medical Association, to study the geographical and seasonal distribution of rheumatic affections. The names of all children who are reported as unable to attend school on this account by private practitioners, school medical officers and school nurses, school attendance officers and health visitors, are collated and, as far as possible, investigated. In this way it is hoped that material of real value towards the elucidation of ætiology, treatment, and educational procedure will be forthcoming.

I am, Sir, yours faithfully,

G. A. AUDEN,

Sept. 20th, 1924. School Medical Officer, Birmingham.

INCIDENCE OF GOITRE IN EGYPT.

To the Editor of THE LANCET.

SIR,—In the paper on the above subject which appeared in THE LANCET of Sept. 13th, the authors, Prof. R. V. Dolbey and Dr. M. Omar, of Cairo, state that they have been informed that there is no goitre in Abyssinia, and that they have seen none in the Sudan. So far as Abyssinia is concerned, the information furnished them would appear to be incorrect, as they will find on reference to an interesting paper by Dr. Charles Singer on Notes on Cases met with in South-Western Abyssinia in March, 1904, which appeared in the *Journal of Tropical Medicine* for 1905 (p. 17). In this paper Dr. Singer states that

> "Cases of goitre were met with throughout our route across Abyssinia, but were much more common in the western than in the eastern part. The cases were usually of a parenchymatous type, but adenomatous and other forms were met with, and Graves's disease seemed far from rare. All the cases of goitre that I saw were in the plateau itself, and I saw none in the low country forming the valley of the Sobat and Baro rivers, which are inhabited by Negro tribes of quite different race to the Gallas and Abyssinians of the high country."

Possibly Prof. Dolbey and Dr. Omar had in mind only the low country to which Dr. Singer refers, as this is the part traversed by the Sobat and Baro, which are large and important tributaries of the White Nile. It should, however, be noted that goitre does occur, and is indeed common in the South-Western portions of Abyssinia. Whether the disease is also met with on the northern part bordering on Lake Tsana, the source of the Blue Nile, I am unable to say. I am, Sir, yours faithfully,

ANDREW BALFOUR.

London School of Hygiene and Tropical
Medicine, Sept. 22nd, 1924.

WORTHING HOSPITAL, SUSSEX.—This excellently managed hospital is one of 46 beds; the governors are hoping in the near future to bring that number up to 100. In the spring of last year a new wing was opened providing for maternity and paying patients, but still the provision is inadequate. Thanks to the balance in hand of £666 at the end of the last financial year and the receipt since Jan. 1st last of £2700 in legacies and life governors' subscriptions, the governors at their meeting decided to proceed at once with a scheme for the rebuilding of the administrative departments and the reconstruction of the heating and hot-water systems, at a cost in round figures of £5000. The difference between the sums of £2700 and £5000 is to be taken from capital as required. Land immediately to the north of the new maternity wing is to be utilised for the purposes of the new departments, and the plans have been so prepared that the new works may harmonise with the still larger developments which are in contemplation. In the present scheme the most pressing need is the reconstruction of the domestic offices: while in the past considerable difficulty has been experienced in keeping the institution warm. The first buildings of the present hospital were opened in 1881, but it was in 1829 that hospital work was begun in the town in two rooms.

politan borough of St. Pancras and the county boroughs of Barnsley, Leeds, Leicester, Sheffield, and Oxford. On three separate occasions this year a single case of the disease has been notified from different metropolitan boroughs. There is no evidence of the presence of small-pox in London at the present time.

Although generally the type of disease continues to be mild, severe cases occur from time to time; in the Willesden urban district in June-July there were ten cases, with three deaths.

SCHOOL MEDICAL SERVICE.

Cardiff.

THE school medical officer for Cardiff, in his report for the year 1923, states that the appointment of an additional medical officer has enabled the authority to cope with the extra work entailed in the extension of the city boundaries in 1922. During the year much attention has been paid to the question of the crippled child. In 1923 there occurred at least 50 fresh cases of infantile paralysis, many of whom are not in touch with any medical organisation, and will probably become incurable cripples before they reach school age. There are in Cardiff 122 children of school age who have never attended school because of one form or another of physical defect, while a further group of 15 put in no attendances in 1923 up to the end of September, thus making a total of 137 whose education as far as public provision is concerned is entirely in abeyance. Altogether in 1923 there were 530 children medically certified as physically defective, 500 of whom require special accommodation. Dr. Ralph M. F. Picken points out that Cardiff is unique among cities in the extent of open space remaining in or near its centre, and suggests the advisability of having a central situation for all special schools, thereby minimising the difficulties of transport. The total number of elementary school-children examined was 10,740. Of the 13,881 children examined in the routine and special groups, 27 per cent. were found suffering from one or more defects, excluding uncleanliness and dental disease, requiring special treatment. Investigations not yet ready for publication are being carried out with reference to the results of operative treatment of tonsils and adenoids and to the incidence and control of enlargement of the thyroid gland.

Colchester.

Dr. W. F. Corfield reports that a sight-saving class has now been opened in East Ward School. This is an important addition to Colchester's scheme of treatment. The class for stammerers is in abeyance this year owing to the few cases at present suffering from this defect. The children who already have had treatment are visited and urged to practise the methods of treatment they were taught. An additional session is now being given to dental inspection and treatment. The number of children with spinal curvature grows steadily less, and Dr. Corfield attributes this to the particular attention paid to physical training. In 1923 there were 88 children with spinal curvature under treatment either by extra physical drill supervised by a teacher at the school, or for the more severe cases by exercises under the organiser of physical training at a special class arranged for the purpose. By the end of the year 33 cases had been cured and seven had been transferred from the spinal class to their own school classes.

Durham.

This report is always interesting. In spite of the shortage of staff and the amount of work done, Dr. G. C. M. McGonigle, assistant school medical officer, has made a special study of the condition of the thyroid gland in the children who came up for routine medical inspection in a particular part of the county. He found that of a total of 478 boys and girls examined 10·3 per cent. showed definite thyroid enlargement, so that in that part of the Wear Valley which lies above Witton-le-Wear, approximately 1 in 6 of all the children examined have definite enlargement of the thyroid gland. The percentage among boys and girls at the age of 5 was found to be practically equal, but at the ages of 8 and 12 there are approximately twice as many cases among girls as boys. A certain amount of thyroid enlargement is normal and common in adolescent girls, but in a goitrous district the condition is found much more frequently at this age than in a non-goitrous district. The distribution of goitre in Weardale is interesting. Dr. McGonigle found that from the head of the Wear to Wolsingham goitre is common, but below this place it is rare. As such excellent results have been got from treating this condition in its initial stages with sodium iodide the suggestion is made that preventive measures should be taken against goitre in the particular districts affected. The expense of such measures would be trifling and could easily be carried out by the school medical staff. An excellent provisional scheme such as is carried out in certain goitrous districts in Switzerland is suggested. Dr. Eustace Hill reports that an extra medical officer is required to complete the necessary code inspections, and by the appointment of an additional nurse a third school clinic which is urgently needed could be staffed.

Gloucestershire.

Dr. J. Middleton Martin records substantial improvement in the cleanliness of the children, the number of children with dirty heads having been reduced from 25 to 11 per cent. in the last ten years or so. Treatment for defects is also going ahead rapidly. At present the scheme for treatment covers only about one-third of the county, but provisional proposals have been made whereby it can readily be extended to embrace the whole area. Dr. Martin urges that the cost of extending the present arrangements to cover the whole county would be approximately only double the present expense. There is one well-coördinated scheme providing for maternity and child welfare and treatment of school-children. Ten schools in the Cinderford area were closed during the year by order of the district council on account of small-pox, and one of the assistant medical officers, Dr. T. F. Blake, who was released for this purpose from ordinary school work, gave valuable help in connexion with the outbreak by discovering in the schools four missed cases of small-pox.

Leamington Spa.

The number of children examined in the three code groups was 1169. Excluding dental defects and uncleanliness, only 8·7 per cent. of these children were found to have defects requiring medical treatment. There is still, unfortunately, a percentage of 57 of unvaccinated children. Twelve cases of goitre were noted, and in five instances a family history of the disease was recorded.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED SEPT. 13TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 54; scarlet fever, 1600; diphtheria, 733; enteric fever, 120; pneumonia, 443; puerperal fever, 41; cerebro-spinal fever, 9; acute poliomyelitis, 23; acute polio-encephalitis, 3; encephalitis lethargica, 43; typhus fever, 1; dysentery, 2; ophthalmia neonatorum, 123. There were no cases of cholera or plague notified during the week. The case of typhus was again from St. Helens.

Deaths.—In the aggregate of great towns, including London, there were 3 deaths from enteric fever, none from small-pox, 16 from scarlet fever, 22 from diphtheria, 9 from measles, 18 from influenza. In London itself the diphtheria deaths numbered 7, and the deaths from infantile diarrhœa, which had been 22, 25, and 30 in the preceding three weeks, declined to 23. Another death from typhus was registered from St. Helens.

Chicken-pox Notifiable.—Ashton-under-Lyne Town Council, in consequence of an outbreak of small-pox, the first for 17 years, has made chicken-pox a notifiable disease for the next six months. Three cases of small-pox have been reported and all contacts have been revaccinated.

Public Health Services.

THE OUTBREAK OF TYPHUS FEVER IN ST. HELENS.

WE are indebted to Dr. Frank Hauxwell, medical officer of health for St. Helens, for some details of the recent outbreak of typhus in that county borough. The first case was discovered on August 12th. After having been ill at home for nearly a week, a girl, aged 14, was sent to the isolation hospital from 18, Bold-street, on the evening of August 11th, by her own doctor as suffering from measles. When seen next day by a medical officer of the health department typhus was suspected, and this was later confirmed by Dr. W. Hanna, of Liverpool. This child died three days after admission. In following this case up it was found on visiting the home that the father had also been ill at home for nearly a week and was being treated for "influenza." He also proved to be suffering from typhus fever and was removed to hospital on August 13th, where he made a good recovery. In pursuing inquiries further it was found that about a month previously (July 13th) another child from the same house had been taken seriously ill and had been treated in the Providence Hospital for "pneumonia," being discharged well from that hospital on August 10th. From a consideration of the history of this case and from the result of a blood-test taken since, there is no doubt that this also was a case of typhus and, so far as is known, the first case of the present outbreak.

The infection had existed, therefore, in the town for at least a month before it came to the knowledge of the health department. The home of this family is in one of the poorer localities of the town and the bedrooms were very dirty, beds and bedding infested with vermin, as also were many cracks and crevices in the plaster. Structurally the house is not in bad sanitary condition. The sleeping accommodation consisted of two upstairs rooms; father, mother, and baby being accommodated in one bedroom, three children in the other. There were no lodgers nor, so far as could be ascertained, had there been any.

On the day following admission of the father to hospital the whole of the remainder of the family, consisting of the mother and three children—i.e., the immediate contacts—were admitted to hospital with a view to personal cleansing and disinfestation and to allow of thorough cleansing of the house. Bedding and wearing apparel were disinfected by steam. Mattresses, flock beds, and a sofa were found to be so infested with vermin that it was considered advisable to destroy them and compensate the owners. The house itself was thoroughly disinfected by spraying, and by arrangement with the owner the walls and ceilings were stripped and re-covered. Other possible contacts were kept under daily observation by a health visitor. The mother and three children were allowed to return home, having been in hospital for eight days. Dr. Hauxwell points out the difficulty there is in enforcing isolation of contacts; this can only be done by application of the local authority to two justices for a removal order, a proceeding which means delay to such an extent as to nullify its value.

The next case to occur was a child, aged 5, sister of the original case. This child was taken ill on August 28th—i.e., 15 days since the removal of the last case and seven days after discharge from hospital as a contact. She was seen on August 29th by the family doctor, who reserved his opinion; later, on the same day a medical officer of the health department diagnosed typhus and the child was removed to the isolation hospital, where she made a good recovery. On the afternoon of August 30th the mother took to bed because she "felt too weak to walk," and when visited on the next day (31st) was also diagnosed typhus and removed to hospital, where she died on Sept. 8th.

In following up the contacts of these cases a sister-in-law, living at 42, Liverpool-street, who had been in more or less close contact with the family, was found on August 31st to be suffering from the disease. She had been under observation since the commencement of the outbreak, and though visited daily said she was perfectly well, yet when detected she had a temperature of 103° F. and was a well-marked case. She was removed to hospital the same day and died there on Sept. 5th. These three cases illustrate the difficulty experienced in dealing with contacts. They had been seen daily by the health visitor, frequently also by a medical officer, and by the sanitary inspector. No indication was obtainable that they were other than well, and yet they must have been—especially in the last case—ill some days previous to discovery, and only willing afterwards to admit that this was so.

The next case to occur was in one of the contacts under observation, a lad, aged 22, living at 44, Liverpool-street. He was found in the early stage of the disease on Sept. 7th and was removed to hospital the same day. In dealing with these later cases the same procedure was adopted as in the earlier cases. The immediate contacts, so far as possible, were removed to hospital with the hope of keeping them there for at least 21 days so as to cover the incubation period. All other contacts are visited daily. Contacts not admitted to hospital are sent there for a bath and disinfection of clothing. Bedding and clothing are disinfected by steam, mattresses and articles which cannot be disinfected are destroyed and compensation paid. The houses are disinfected and the walls stripped and cleansed. Dr. Hauxwell acknowledges the ready compliance of house owners with his wishes.

Further steps being taken with a view to limiting the spread of the disease are as follows: (*a*) House-to-house visitation in the immediate vicinity by one of the sanitary inspectors; where necessary, disinfection of the house and lime-washing of walls is recommended, lime-wash and brush being supplied for the purpose; if necessary official notice to cleanse under Public Health Act, 1875, Section 46, is served; disinfection of bedding, clothing, and of persons offered wherever advisable. (*b*) Special attention regarding cleanliness to scholars attending schools in the immediate vicinity, since mild or abortive cases are apt to occur in children; inquiry regarding all absentees. (*c*) All cases of illness in the vicinity inquired into as far as possible. (*d*) Issue of leaflet and posters drawing attention to the dangers of the disease and importance of cleanliness in fighting it.

So far there have been eight cases, with four deaths. The last case occurred on Sept. 13th in a boy of 12, who had been detained as a contact at the hospital since Sept. 1st. Ten contacts are at present in hospital and 90 others are under supervision.

SMALL-POX IN ENGLAND AND WALES DURING 1924.

UP to the end of the second week in September small-pox appeared in 91 sanitary (including port) districts, the total number of cases being approximately 2750, as compared with 1840 in the corresponding period of 1923. Derbyshire accounts for 1080 cases in 16 sanitary districts (more than one half in the borough and rural district of Chesterfield); Nottingham for 434 cases in 10 districts. 386 cases occurred in Yorkshire (mainly in Middlesbrough) and 306 in Northumberland (mainly in Ashington).

At the present time small-pox is prevalent in Middlesbrough, Chesterfield, and the urban district of Hucknall, in all of which districts the disease has continued to be present since the autumn of 1923. Other sanitary districts now mainly affected are Derby, Mansfield, the rural district of Chesterfield, and the urban districts of Mansfield Woodhouse, Ashington, Melton Mowbray, and Gainsborough. Within the last four weeks sporadic cases have occurred in 21 other sanitary districts, including the metropolitan borough of St. Pancras and the county boroughs of Barnsley, Leeds, Leicester, Sheffield, and Oxford. On three separate occasions this year a single case of the disease has been notified from different metropolitan boroughs. There is no evidence of the presence of small-pox in London at the present time.

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WE are indebted to Dr. Frank Hauxwell, medical officer of health for St. Helens, for some details of the recent outbreak of typhus in that county borough. The first case was discovered on August 12th. After having been ill at home for nearly a week, a girl, aged 14, was sent to the isolation hospital from 18, Bold-street, on the evening of August 11th, by her own doctor as suffering from measles. When seen next day by a medical officer of the health department typhus was suspected, and this was later confirmed by Dr. W. Hanna, of Liverpool. This child died three days after admission. In following this case up it was found on visiting the home that the father had also been ill at home for nearly a week and was being treated for "influenza." He also proved to be suffering from typhus fever and was removed to hospital on August 13th, where he made a good recovery. In pursuing inquiries further it was found that about a month previously (July 13th) another child from the same house had been taken seriously ill and had been treated in the Providence Hospital for "pneumonia," being discharged well from that hospital on August 10th. From a consideration of the history of this case and from the result of a blood-test taken since, there is no doubt that this also was a case of typhus and, so far as is known, the first case of the present outbreak.

The infection had existed, therefore, in the town for at least a month before it came to the knowledge of the health department. The home of this family is in one of the poorer localities of the town and the bedrooms were very dirty, beds and bedding infested with vermin, as also were many cracks and crevices in the plaster. Structurally the house is not in bad sanitary condition. The sleeping accommodation consisted of two upstairs rooms; father, mother, and baby being accommodated in one bedroom, three children in the other. There were no lodgers nor, so far as could be ascertained, had there been any.

On the day following admission of the father to hospital the whole of the remainder of the family, consisting of the mother and three children—i.e., the immediate contacts—were admitted to hospital with a view to personal cleansing and disinfestation and to allow of thorough cleansing of the house. Bedding and wearing apparel were disinfected by steam. Mattresses, flock beds, and a sofa were found to be so infested with vermin that it was considered advisable to destroy them and compensate the owners. The house itself was thoroughly disinfected by spraying, and by arrangement with the owner the walls and ceilings were stripped and re-covered. Other possible contacts were kept under daily observation by a health visitor. The mother and three children were allowed to return home, having been in hospital for eight days. Dr. Hauxwell points out the difficulty there is in enforcing isolation of contacts; this can only be done by application of the local authority to two justices for a removal order, a proceeding which means delay to such an extent as to nullify its value.

The next case to occur was a child, aged 5, sister of the original case. This child was taken ill on August 28th—i.e., 15 days since the removal of the last case and seven days after discharge from hospital as a contact. She was seen on August 29th by the family doctor, who reserved his opinion; later, on the same day a medical officer of the health department diagnosed typhus and the child was removed to the isolation hospital, where she made a good recovery. On the afternoon of August 30th the mother took to bed because she "felt too weak to walk," and when visited on the next day (31st) was also diagnosed typhus and removed to hospital, where she died on Sept. 8th.

In following up the contacts of these cases a sister-in-law, living at 42, Liverpool-street, who had been in more or less close contact with the family, was found on August 31st to be suffering from the disease. She had been under observation since the commencement of the outbreak, and though visited daily said she was perfectly well, yet when detected she had a temperature of 103° F. and was a well-marked case. She was removed to hospital the same day and died there on Sept. 5th. These three cases illustrate the difficulty experienced in dealing with contacts. They had been seen daily by the health visitor, frequently also by a medical officer, and by the sanitary inspector. No indication was obtainable that they were other than well, and yet they must have been—especially in the last case—ill some days previous to discovery, and only willing afterwards to admit that this was so.

The next case to occur was in one of the contacts under observation, a lad, aged 22, living at 44, Liverpool-street. He was found in the early stage of the disease on Sept. 7th and was removed to hospital the same day. In dealing with these later cases the same procedure was adopted as in the earlier cases. The immediate contacts, so far as possible, were removed to hospital with the hope of keeping them there for at least 21 days so as to cover the incubation period. All other contacts are visited daily. Contacts not admitted to hospital are sent there for a bath and disinfection of clothing. Bedding and clothing are disinfected by steam, mattresses and articles which cannot be disinfected are destroyed and compensation paid. The houses are disinfected and the walls stripped and cleansed. Dr. Hauxwell acknowledges the ready compliance of house owners with his wishes.

Further steps being taken with a view to limiting the spread of the disease are as follows: (*a*) House-to-house visitation in the immediate vicinity by one of the sanitary inspectors; where necessary, disinfection of the house and lime-washing of walls is recommended, lime-wash and brush being supplied for the purpose; if necessary official notice to cleanse under Public Health Act, 1875, Section 46, is served; disinfection of bedding, clothing, and of persons offered wherever advisable. (*b*) Special attention regarding cleanliness to scholars attending schools in the immediate vicinity, since mild or abortive cases are apt to occur in children; inquiry regarding all absentees. (*c*) All cases of illness in the vicinity inquired into as far as possible. (*d*) Issue of leaflet and posters drawing attention to the dangers of the disease and importance of cleanliness in fighting it.

So far there have been eight cases, with four deaths. The last case occurred on Sept. 13th in a boy of 12, who had been detained as a contact at the hospital since Sept. 1st. Ten contacts are at present in hospital and 90 others are under supervision.

SMALL-POX IN ENGLAND AND WALES DURING 1924.

UP to the end of the second week in September small-pox appeared in 91 sanitary (including port) districts, the total number of cases being approximately 2750, as compared with 1840 in the corresponding period of 1923. Derbyshire accounts for 1080 cases in 16 sanitary districts (more than one half in the borough and rural district of Chesterfield); Nottingham for 434 cases in 10 districts. 386 cases occurred in Yorkshire (mainly in Middlesbrough) and 306 in Northumberland (mainly in Ashington).

At the present time small-pox is prevalent in Middlesbrough, Chesterfield, and the urban district of Hucknall, in all of which districts the disease has continued to be present since the autumn of 1923. Other sanitary districts now mainly affected are Derby, Mansfield, the rural district of Chesterfield, and the urban districts of Mansfield Woodhouse, Ashington, Melton Mowbray, and Gainsborough. Within the last four weeks sporadic cases have occurred in 21 other sanitary districts, including the metrolaboratories of the Fund, published in THE LANCET of July 26th, 1924, was probably his last public utterance of importance.

Sidney Martin was a sincere worker and a clear thinker. He was impatient of dullness and prolixity in colleagues or students, but had no sarcasm for the tiresome garrulous patient. He was a pioneer in a forest which is now being systematically cleared, a region where chemistry and physiology jointly throw light on disease, and his labours were directed towards the removal of just those obstructions which subsequent workers have found it necessary to attack.

Medical News.

CHELSEA CLINICAL SOCIETY.—The annual dinner of the Society is arranged to take place at the Café Royal, Regent-street, London, on Tuesday, Oct. 21st, at 7 for 7.30 P.M.

LONDON MEDICAL SCHOOL DINNERS.—Owing to the sudden death of Dr. Sidney Martin, senior physician to University College Hospital, the dinner of the past and present students of the hospital, which was to be held at the Hotel Cecil on Oct. 3rd, has been postponed to some date to be arranged in December.—The following is a diary of the other London medical school dinners, fuller details of which appeared in our columns last week: *Wednesday, Oct. 1st*: St. Bartholomew's Hospital, in the Great Hall of the hospital; Charing Cross Hospital, in Gatti's Restaurant, Strand; St. George's Hospital, in the New Hotel Metropole; King's College Hospital, in the Connaught Rooms, Great Queen-street; London Hospital, in the Trocadero Restaurant, Shaftesbury-avenue; Middlesex Hospital, in the Hotel Cecil.—*Monday, Oct. 6th*: St. Mary's Hospital, in the Connaught Rooms, Great Queen-street.—*Friday, Oct. 24th*: St. Thomas's Hospital, in Prince's Restaurant, Piccadilly.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The opening of the winter session of the School of Pharmacy, 17, Bloomsbury-square, London, W.C., will take place on Oct. 1st at 3 P.M., when the President, Mr. F. Pilkington Sargeant, will present the Pereira Medal and deliver the inaugural sessional address.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W. 1, on Oct. 8th, at 5 P.M., when a discussion on the relative values of stone-milled and other flours and breads, in relation to the nutrition of the growing child, will be opened by Dr. Robert Hutchison. There will be illustrative exhibits of stone-milled flours, breads, and other wheaten foods.

PROFESSIONAL AND BUSINESS WOMEN'S HOSPITAL LEAGUE.—Miss Philippa Strachey has succeeded Miss Mildred Ransom as secretary to this League, and after Oct. 1st all communications intended for the League should be addressed to her at 35, Marsham-street, Westminster, London, S.W. 1.

THE LATE DR. DANIEL BIDDLE.—Daniel Biddle, M.R.C.S. Eng., L.S.A., who died at his residence at Kingston-on-Thames on Sept. 14th, was a man of many diverse talents. A son of the late Lieut.-Colonel Biddle, of the Madras Artillery, he was born in Gloucestershire in 1840. He received his early education at Taunton and studied medicine at Somerset County Hospital, at the London University, and at St. Thomas's Hospital, qualifying at the age of 22. After a period as house surgeon at St. Thomas's Hospital, he took up medical and surgical work at Kingston in 1868, where he remained in practice for over 46 years. Since his retirement nearly ten years ago he had been very little in the public eye, but for many years he was a prominent local figure and a member of the Kingston and District Medical Society. He was a distinguished mathematician, and for some years held the post of mathematical editor of the *Educational Times*. He was also an able and accomplished statist and a member of the Royal Statistical Society. He gave valuable asistance to the General Medical Council in the preparation of four special reports issued between the years 1885 and 1887, and it was under his supervision that the census of the medical profession in 1881 and that of 1886 were issued, reports which had their influence on the decision to extend the period of medical studentship to five years. A pioneer in the standardisation of medical fees, Dr. Biddle founded for this purpose the Thames Valley Medical Association. He took a leading part in the agitation against the dual system of notification embodied in the Infectious Diseases Act of 1889, and carried the opposition into both Houses of Parliament. He contributed a paper on the subject to the Section of State Hygiene at the International Congress of Hygiene and Demography held in London in 1891, in addition to articles to the lay and medical press. His many interests included such subjects as aeronautics, theology, genealogy, and shorthand, to all of which he made original contributions, having invented a special type of balloon as well as a new system of shorthand. For 20 years he advocated on scientific grounds the legalising of marriage with a deceased wife's sister. Dr. Biddle is survived by five daughters, his wife having predeceased him in 1904.

INTERNATIONAL DENTAL EXHIBITION.—This exhibition, under the auspices of the Incorporated Dental Society, will again be held this year at the University of London Imperial Institute, South Kensington, S.W. 7, opening on Sept. 29th for one week.

DONATIONS AND BEQUESTS.—By the will of the late Mr. W. H. Revis, of Nottingham, the testator left, among other bequests, £3000 to the Nottingham General Hospital and £500 to the Fielding Palmer Cottage Hospital at Lutterworth.—The Royal Northern Hospital, Holloway, has received £1000, a share of the residue of the estate of the late Mr. Arthur Daniel Serena.—Mr. Frederick Fountain has bequeathed to the Miller General Hospital for South-East London a house known as Cedar Bank as a convalescent home and £12,000 as an endowment for its upkeep.—The executors of the late Lieut.-Colonel T. Thornycroft Vernon have given £1200 for the endowment of a bed in the male ward of the Chester Royal Infirmary.—Sir Ewen J. Maclean, professor of obstetrics and gynæcology in the Welsh National School of Medicine, has given 1000 guineas to the Royal Infirmary, Cardiff, to endow an "Agnes Maclean" bed in memory of his mother.

NATIONAL MEDICAL UNION.—This Union is making an effort to collect evidence of medical opinion throughout the country, in support of its policy, for presentation to the forthcoming Royal Commission on National Health Insurance. The essence of this policy is: (1) That a State Medical Service is necessary only for genuinely necessitous persons, otherwise defined as destitute persons or as persons temporarily or permanently unable to provide for themselves. (2) That the matter of insurance against the financial risks of sickness, of which, in principle, the Union approves, should have separate treatment. The Union proposes that this should be effected by a genuine system of insurance against doctors' bills, cost of drugs, institutional treatment, &c., and that the profession of medicine should be left absolutely free from State interference to develop on the traditional lines of private practice. The National Deposit Friendly Society and the Scottish Clerks' Association are cited as examples of the type of insurance indicated before the present Act came into force. A circular letter has been issued signed by Drs. A. Blackhall-Morison, W. Russell, and J. Howson Ray, with the request that approval of the policy should be communicated to Dr. E. H. Worth, hon. sec., National Medical Union, 11, Chandos-street, London, W. 1.

HERBAL REMEDIES: A REMARKABLE COINCIDENCE.

MEDICAL practitioners are receiving through the post a pamphlet issued by Heath and Heather, herb specialists, of St. Albans, which contains a list of herbal remedies and notes on their adaptability to the treatment of common illnesses. "There has been a most remarkable improvement," the pamphlet states, "in the health of the nation during the last three years," and goes on to add: "It is a remarkable coincidence that for those three years Heath and Heather were in business." The coincidence is not so difficult to explain as the statement on page 86 of the pamphlet asking readers to "consider that of the children born in the homes of merry England, only two-thirds reach the age of one year, and that quite half of those who survive carry with them all their lives some physical imperfection inherited from previous generations." From this it is a small step to the deduction that, as medical knowledge presumably advances, physical deterioration also creeps on. A printed slip enclosed in the pamphlet states that owing largely to the child welfare movement the death-rate among children under one year of age was only 60 per 1000 last year, but adds that the remark on page 86 was accurate when the passage was written "some years ago." If it was accurate when written it cannot have been written since the Wars of the Roses. It is hardly a coincidence that such colossal ignorance of vital statistics should coincide with outrageous claims for the properties of herbs. Packet 25, for instance, will form a complete cure for diabetes in its early stages.

Obituary.

SIDNEY HARRIS COX MARTIN, M.D., F.R.C.P., B.Sc. Lond., M.R.C.S. Eng., F.R.S.

The sudden death on Sept. 22nd of Dr. Sidney Martin will distress all who have come into contact with him as colleague, physician, or teacher. His interests had a wide range—from biology, which gained him the degree of B.Sc. Lond. in 1878, through physiology and pathology to clinical medicine. It is small wonder that even the iconoclasts among the younger medical scientists of to-day speak respectfully of his clinical acumen, tempered and controlled by such wide general knowledge. Indeed, the willing services of Dr. Martin were often commandeered by sick colleagues, to whom his gruff optimism brought more cheer than did the suave urbanities of a polished bedside manner.

Sidney Martin was born in Jamaica in 1860, and was educated at University College, London, and in Vienna. After taking his science degree he turned to the study of medicine, qualifying M.R.C.S. Eng. in 1882, M.B., B.S. Lond. in 1883, taking the University scholarship in medicine and honours in surgery, and M.D. Lond in 1884, and becoming successively Member and Fellow of the Royal College of Physicians on London a few years later. The scientific aspect of medicine claimed him from the first, and he became pathologist, curator to the museum, and medical tutor to the Middlesex Hospital and pathologist and medical registrar to the City of London Hospital for Diseases of the Chest. The physiology and pathology of digestion intrigued Martin throughout his career, and his studies on protein metabolism in health and disease, the subject of a communication to the Section of Pathology of the B.M.A. in 1890, led him to investigate the chemical pathology of protein poisons in infective disorders. In his Goulstonian lectures, published in The Lancet,[1] he compared the chemical pathology of diphtheria with that of anthrax, infective endocarditis, and tetanus. The main thesis of these lectures would not be disputed to-day—that knowledge of the morphology of the primary infective agent cannot explain the symptoms of disease, and that, beside the study of the causative organism and of the histological lesion, investigation of the poisonous product of the infective agent is needed. The further prosecution of his studies into the chemical products of pathogenic bacteria formed the subject of his Croonian lectures[2] in 1898, by which time Martin was both a Fellow and professor of pathology at University College, and also assistant physician to University College Hospital and to the Hospital for Consumption at Brompton. Experimental pathology was still despised by many physicians as irrelevant to medical work, but Martin was even at this time a firm defender of controlled animal experiments to supplement clinical observation of patients, which, however, he neither underrated nor neglected. In 1895 he wrote a book on Functional and Organic Disease of the Stomach, and he continued for many years to publish contributions to books (notably to Gibson's Text-book of Medicine, Quain's Dictionary of Medicine, Bain's Text-book of Practical Medicine, and Clifford Allbutt's System of Medicine), and to journals on the disorders of the digestive system. His Lettsomian lectures, delivered in 1909, were on Functional Disorders of the Stomach and Intestines, and the Lumleian lectures in 1915 on Chronic Infections of the Colon completed this long series of observations on the pathology of the digestive tract.

Meanwhile, however, Martin's critical faculties were being used in another field, in connexion with the Royal Commission appointed in 1890, and reappointed in 1894, to inquire into the effect of food derived from tuberculous animals on human health. The object of the investigation was to determine whether the meat and milk of tuberculous cows was capable of transmitting the disease, and his Appendix to the Report, issued in 1896, described with great minuteness and exactness a very detailed inquiry. A large part of the Report of the Royal Commission consisted in the evaluation of Martin's conclusions, which were adopted generally by the Commission, who regarded it as established that any person who takes tuberculous matter into the body as food incurs risk of acquiring tuberculous disease. In 1895 Martin was made a Fellow of the Royal Society, and in 1903 he published his well-known text-book on pathology. In this book he recognised that his title would cover two great groups of work, morbid histology and general pathology, but he deals only with the latter, assuming in the reader some practical familiarity with the former and with the elements of bacteriology. The work was recognised at once by all as of high excellence, giving a complete survey, at the time of its issue, of a rapidly growing subject, and familiarising the learner with the problems presented by infection and immunity as well as with the phenomena and results of inflammation. The many concise and lucid summaries formed a feature of this valuable text-book.

During the war Sidney Martin was attached to the Third London General Hospital at Wandsworth and worked strenuously, since his duties as physician and professor of clinical medicine of University College Hospital could not be neglected, and were carried on concurrently with his war work. This was not confined to a duplication of his clinical responsibilities. In March, 1916, a committee was appointed by the Royal Colleges of Physicians and Surgeons to advise the Government in relation to medical practitioners in the metropolitan district required for service in the army, including members of the staffs of the London medical schools and hospitals. Sidney Martin was one of the first representatives of the Royal College of Physicians on this committee, afterwards known as the Committee of Reference, and was made chairman of the subcommittee which dealt with appeals submitted on behalf of hospitals against the undue depletion of their staffs, as well as with the preparation of lists of those who could properly be called on for war service. This subcommittee met frequently and its labours were onerous. Martin was always at his place in the chair, and his judgment, tact, and power of rapidly seeing the essential factors in each case through the maze of detail presented rendered his services of the greatest value. He represented the Committee of Reference in the joint deliberations with the Central Medical War Committee, and took a prominent part in drafting a report of the Joint Committees on the treatment of discharged disabled soldiers, having already been largely responsible for an important report on the medical treatment of dischargeable disabled soldiers in 1916. He was one of the assessors under the Appeals Tribunal of the Local Government Board, and became chairman of the subcommittee of the Committee of Reference dealing with the proceedings of the Boards of Assessors.

Sidney Martin was privileged to serve the Royal College of Physicians throughout his career. He was a member of the Joint Committee of the Royal Colleges of Physicians and Surgeons which controlled the laboratories on the Embankment in which original research was carried on from 1900 to 1905. He was examiner in medicine on the Conjoint Board of the Royal Colleges from 1907 to 1910, a member of the Council of the Royal College of Physicians in 1910–11, a censor in 1915–16, and was selected to represent the College on the Senate of the University of London in 1919. Moreover, on the foundation of the Imperial Cancer Research Fund in 1902, Dr. Martin was appointed on its executive committee as one of the representatives of the Royal College of Physicians, and he remained a member until his death. On the retirement of Sir William Church from the chairmanship of this committee last year, Sidney Martin was appointed to succeed him, and his clear summary of the recent work carried out in the

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[1] The Lancet, 1892, i., 677, 735, 787.

[2] The Lancet, 1898, i., 1665, 1737; ii., i., 71.

Notes, Comments, and Abstracts.

THE PHYSIOLOGY OF A COMMON COLD.

By S. E. Kark, M.B., Ch.B. Edin.,

NEW SOMERSET HOSPITAL, CAPE TOWN.

SINCE the acceptance in medicine of the microbic origin of disease, a tendency has been noticeable to look to external and accidental factors, rather than to internal physiological causes, for the incidence of many maladies. That everyday disease, the "common cold," comes under the same category. Its origin has been traced on laboratory evidence to microbic infection, but that microbic invasion is not the primary cause is evident for several reasons :—

(1) A common cold does not per se produce the usual concomitants of infection—rise of temperature, quickened pulse, and the like.

(2) It is generally brought about by sudden changes of temperature—e.g., on emerging from a warm room into the cold air, discarding warm clothing habitually worn, sudden atmospheric changes frequent in spring and autumn.

(3) The onset can be produced experimentally by exposing any part of the body ordinarily protected against cold to the effects of a chilling draught.

Current Explanation Inadequate.

The usual explanation, that the lowered vitality due to the chill makes the body more susceptible to infection, is hardly adequate. For the nasal chambers were not exposed to new organisms while the cold was being induced. The organisms present in the nose—saprophytic until the chill began to work—surely must require time to assume virulence. All infections have a longer or shorter incubation period, while a "cold" becomes manifest almost immediately after exposure. Other vitality-lowering agencies, such as hæmorrhages, never induce colds. I am therefore led to believe that a common cold is the result of a physiological process overdone : a normal function turned into the pathological—as a good many pathological conditions are—through Nature being stimulated to over-activity on being called upon to act precipitately in defence.

Now, the physical quality of evaporation as a temperature-lowering agent is well known. Nature, indeed, has made use of its cooling effects by incorporating it as an adjunct to the heat-regulating centre of the body, as is seen when we perspire on a hot day. In the nasal passages we have two roomy chambers, with a surface area augmented by the convolutions of the turbinates : from this large surface, normally constantly moist, it is estimated that one litre of water is evaporated every 24 hours. It is reasonable to assume that it is one of the functions of the nasal chambers thus to act as an auxiliary to the heat-regulating centre. Through these moist chambers a current of air is constantly passing. The evaporation resulting therefrom must be considerable, and as a consequence the temperature-lowering effects on the nasal mucous membrane produced by this constant evaporation must likewise be quite considerable. The cooled blood from the nasal chambers entering the general circulation must in its turn help to lower the general body temperature.

Emergency Heat Regulation.

Under normal conditions the loss of heat to the body resulting from the nasal evaporation is adjusted through the heat-regulating centre, as all other bodily heat losses are, by heat production through metabolic changes. But when too sudden a demand is made on the heat-regulating mechanism, it cannot be balanced immediately by heat production. Nature, then, has recourse to another expedient, and that is, by stopping as soon as possible all the heat leakages which are generally going on in the body. As an example of this may be cited the contraction of the skin vessels on exposure to cold. Loss of heat through the nasal chambers may be eliminated in two ways :

(a) *By acting on the cooling medium ;* turning off, so to speak, the tap of the chamber containing the cooled blood by retarding the rate of its inflow into the general circulation.

(b) *By acting on the cooling agent ;* diminishing the air current passing through the nasal chambers.

These two actions are accomplished by the heat-regulating centre in two ways. The nasal mucous membrane has a large vaso-motor nerve-supply as well as very numerous nets of blood-vessels. By sudden vaso-motor paresis a marked stasis and congestion of the nasal mucous membrane takes place. The rate of flow of cooled blood into the general circulation is thus greatly retarded. The stasis and congestion produce at the same time a definite swelling of the erectile mucous membrane of the inferior and middle turbinates and of the anterior part of the septum. The air-way is diminished, with the result that the volume of air that can pass, the evaporation and its resulting cooling effects, are all proportionally reduced. Moisture accumulates in the chamber—the cause of the running nose—and this again helps further to diminish the volume of air passing.

In addition to this vaso-motor controlling action, respiration also plays a part in the adjustment of both the cooling agent and the cooling medium. For, on exposing the body to the effects of cold the breath is held, respiration is first temporarily inhibited, and if the exposure to the cold is continued, respiration becomes shallow. This, too, has a double effect. The volume of air passing through the nasal passages is further lessened, while the suction action of inspiration on the nasal circulation is diminished. Hence, the congestion of the nasal mucous membrane is still more favoured. The importance of this suction action is demonstrated by the ease with which a partial blockage of the nose is often overcome by a few deep inspirations.

Response of Defensive Nature.

In this view a common cold is primarily a physiological process, a local response of a defensive nature to a sudden physiological demand. It is only afterwards, when congestion and stasis have been established, when warm moist air—now almost stationary—fills the nasal cavities, that microbic growth contributes its quota to the aggravation of the trouble.

Since this sudden application by the heat-regulating centre of the vaso-motor and respiratory brakes, in order to stop the heat leakages through the nasal chambers, must interfere with the normal functions of the nose, it stands to reason that Nature would make use of this method only as an emergency measure : under certain contingencies which would arise for instance :—

(a) When the heat-regulating centre itself is faulty. This is the case in very young children whose mechanism, compared with that of an adult, functions imperfectly. For, while an adult's temperature generally remains constant irrespective of the temperature by which he is surrounded, that of a child fluctuates to some degree in accordance with the variations in temperature of the bodies with which it comes in contact. This imperfect working of the heat-regulating mechanism in the child accounts for the susceptibility of children to catarrh of the upper air-passages.

(b) When the auxiliaries to the heat-regulating centre do not act well—e.g., when the skin through too much protection of warm clothing has not been allowed to react quickly to sudden changes in temperature. Thus people who are apt to coddle catch cold easily, while soldiers and those who lead an open life do not.

(c) When the heat-regulating centre has to act precipitately, as on sudden exposure to a draught, or during sudden temperature changes as in spring and autumn.

Prophylaxis.

The better the heat-regulating centre is functioning, and the more responsive are its auxiliaries—the skin and vaso-motor nerves—the less occasion would arise under sudden strain for panicky action and its product, the "common cold." It would therefore seem that the prevention of the onset of common colds can best be achieved by training and developing the auxiliaries of the heat-regulating centre to respond quickly to altered temperature conditions. Children ought to be hardened from infancy, cold sponging should follow the daily tepid bath, older children should have a cold shower. Children should not be overburdened with too much clothing. Finally, breathing exercises relieve and overcome nasal congestion, the suction action of deep inspiration improving the circulation and the tone of the nasal mucous membrane.

MENTAL HOSPITALS IN THE EAST.

THE recently published "Triennial Reports for the Mental Hospitals of Assam, Burma, and the Punjab," covering the period 1921–23, reveal closely similar conditions in lunacy administration in these three States. The most important change is a slow but steady increase in the numbers of certified insane. Whether this be due to the more efficient detection of mental disease, or actually to a general increase in the prevalence of insanity, is not suggested. Since the population of mental hospitals is apparently increasing all over the world, it is of the greatest interest to ascertain whether this indicates an increased ratio of sane to insane among the general population, and if so, upon what factors this change depends. In reports from such distant parts of the world as these, whose conditions it is impossible to

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday. and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Thursday, Oct. 2nd.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Specimens:

Dr. H. Russell Andrews: Lipoma Ulcerating through the Vagina and causing Severe Hæmorrhage in a Girl of 19.

Dr. J. S. Fairbairn and Dr. J. Taylor: Simple Ovarian Embryoma with Spread into Contiguous Structures.

Short Communication:

Dr. H. Russell Andrews: An Unusual Retroperitoneal Tumour.

Paper:

Dr. John Marrack: The Plasma Proteins in Normal and Abnormal Pregnancy, by L. J. Coetzee.

OPENING OF MEDICAL SCHOOLS.

MONDAY, Sept. 29th, and TUESDAY, Sept. 30th.—First-year students of the Faculty of Medical Sciences, University College (University of London), will be received from 10 A.M. to 1 P.M. by the Provost, the Dean of the Faculty, and the Sub-Dean. Other than first-year students will be received on Monday, the 29th, from 2.15 to 4 P.M., and candidates for the Diploma of Public Health will be received by Prof. Kenwood at 3.15 P.M.

WEDNESDAY, Oct. 1st.—Charing Cross Hospital, prize distribution by Sir Humphry Rolleston at 3.30 P.M.—St. George's Hospital, prize distribution and inaugural address by Sir Isambard Owen at 3 P.M.—King's College Hospital, prize distribution and inaugural address by Sir David Ferrier at 2.30 P.M.—Middlesex Hospital, prize distribution by Lord Birkenhead and inaugural address by Dr. Charles Porter on Some Aspects of Preventive Medicine, at 3 P.M.

THURSDAY, Oct. 2nd.—Westminster Hospital, introductory address by Mr. H. J. Waring on the Medical Man of the Future, at 3 P.M.

LECTURES ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, Sept. 29th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.

TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY, Oct. 1st.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, Sept. 30th.—4.15 P.M., Mr. J. Howson Ray: Carcinoma of the Rectum, Operable and Inoperable.

FRIDAY, Oct. 3rd.—4.15 P.M., Prof. H. S. Raper: Fat Metabolism and Some of Its Disorders.

Appointments.

HOPKINS, W. E., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., has been appointed Tuberculosis Physician for the County of Merioneth.

MCARDLE, P. T., M.B., B.Ch. R.U.I., Master of the National Maternity Hospital, Dublin.

Royal Infirmary, Sunderland: PUNSHON, G., M.B., B.S. Durh. and STROTHER, T., M.B., B.S. Durh., House Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Altrincham General Hospital, Cheshire.—H.S. £125.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.

Birmingham Education Committee.—Ophth. S. £265.

Burton-upon-Trent County Borough.—Asst. M.O. £600.

City of London Hospital for Diseases of the Heart, Victoria Park, E.—P.

Durham County Council, Maternity and Child Welfare.—Asst. Welfare M.O. £600.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £50. Also H.P. and Asst. Cas. O. £50.

Johannesburg. S. African Institute for Medical Research.—Bacteriologist.

King's College Hospital, Denmark Hill, S.E.—Clin. Assts., &c.

Leamington Spa, Warneford, Leamington and South Warwickshire General Hospital.—Res. H.S. £150.

Manchester Royal Eye Hospital.—Jun. H.S. £120.

Manchester Royal Infirmary.—Asst. Res. M.O. £200.

Ministry of Health.—Three M.O.'s. £600.

Napsbury Mental Hospital, near St. Albans, Herts.—Fourth Asst. M.O. £526 10*s.*

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Phys. to Out-patients.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £350.

Paddington Green Children's Hospital, W.—H.S. £150.

Pietermaritzburg, S. Africa, Grey's Hospital.—H.S. £400.

Queen's Hospital for Children, Hackney-road, E.—H.S. £100. Two H.P.'s, Cas. H.S. Each £100. Also P. in charge of Skin Dept.

Rhondda Urban District Council.—Asst. Sch. M.O. £600.

Royal Chest Hospital, City-road, E.C.—P.

Royal Naval Medical Service.—Surg. Lieuts. 25*s.* per day.

St. Marylebone Hospital, Northumberland-street, W.—Visiting Consultant for the Nose, Ear, and Throat Dept. £100.

Salford and Broughton Areas.—Dist. M.O.

Shanghai Municipal Council, Public Health Department.—Asst. Path. £1250.

South Wales Sanatorium, Talgarth, Breconshire.—First Asst. Res. M.O. £375.

Staffordshire General Infirmary, Stafford.—H.P. £150.

University College Hospital, Gower-street, W.C.—Res. M.O. £150.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non-res. H.S. £150 and £100 respectively.

Willesden General Hospital, Harlesden-road, N.W.—H.S. £100.

Births, Marriages, and Deaths.

BIRTHS.

BARLEE.—On Sept. 16th, in Hull, the wife of R. J. Barlee. Surgeon-Lieutenant-Commander, R.N. (ret.), of a daughter.

BATTEN.—On Sept. 13th, at Lyndhurst-road, Hampstead, N.W., the wife of Lindsey W. Batten, M.B., M.R.C.P., of a daughter.

MARRIAGES.

FRY—MATTHEW.—On Sept. 17th, at St. Peter's, Limpsfield, Lewis Salisbury Fry, M.B., to Margaret Mary Matthew, daughter of George Cory Matthew.

PARTRIDGE—MEDLOCK.—On Sept. 18th, at St. Stephen's, Hampstead, William Linnell Partridge, M.C., M.R.C.S. Eng., L.R.C.P. Lond., L.D.S., to Katie, only daughter of the late C. W. Medlock, Esq., and of Mrs. Medlock, of Hampstead.

TOOP—SWINDELL.—On Sept. 16th, at St. Andrew's, Muswell Hill. Howard Metherell Toop, M.R.C.S., L.R.C.P., to Eleanor Mary Rose, only daughter of the late J. J. Swindell, M.R.C.S., of North Finchley, and of Mrs. Swindell, of Muswell Hill.

WADE—FRASER-TYTLER.—On Sept. 18th, at Holy Trinity Church, Melrose, Henry Wade, C.M.G., D.S.O., M.D., F.R.S.C.E., to Marjorie, only daughter of the late James William Fraser-Tytler, of Woodhouselee, Midlothian, and of Mrs. Fraser-Tytler, senr., The Priory, Melrose.

DEATHS.

BROWNE.—On Sept. 16th, at La Soldanelle, Rougemont, Switzerland, Surgeon-General William Richard Browne, C.I.E., M.D., I.M.S. (retd.), aged 74.

MARTIN.—On Sept. 22nd, suddenly, at Wimpole-street, W., Sidney Harris Cox Martin, M.D., F.R.S., aged 64 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

THE PHYSIOLOGY OF A COMMON COLD.

BY S. E. KARK, M.B., CH.B. EDIN.,

NEW SOMERSET HOSPITAL, CAPE TOWN.

SINCE the acceptance in medicine of the microbic origin of disease, a tendency has been noticeable to look to external and accidental factors, rather than to internal physiological causes, for the incidence of many maladies. That everyday disease, the "common cold," comes under the same category. Its origin has been traced on laboratory evidence to microbic infection, but that microbic invasion is not the primary cause is evident for several reasons :—

(1) A common cold does not per se produce the usual concomitants of infection—rise of temperature, quickened pulse, and the like.

(2) It is generally brought about by sudden changes of temperature—e.g., on emerging from a warm room into the cold air, discarding warm clothing habitually worn, sudden atmospheric changes frequent in spring and autumn.

(3) The onset can be produced experimentally by exposing any part of the body ordinarily protected against cold to the effects of a chilling draught.

Current Explanation Inadequate.

The usual explanation, that the lowered vitality due to the chill makes the body more susceptible to infection, is hardly adequate. For the nasal chambers were not exposed to new organisms while the cold was being induced. The organisms present in the nose—saprophytic until the chill began to work—surely must require time to assume virulence. All infections have a longer or shorter incubation period, while a "cold" becomes manifest almost immediately after exposure. Other vitality-lowering agencies, such as hæmorrhages, never induce colds. I am therefore led to believe that a common cold is the result of a physiological process overdone : a normal function turned into the pathological—as a good many pathological conditions are—through Nature being stimulated to over-activity on being called upon to act precipitately in defence.

Now, the physical quality of evaporation as a temperature-lowering agent is well known. Nature, indeed, has made use of its cooling effects by incorporating it as an adjunct to the heat-regulating centre of the body, as is seen when we perspire on a hot day. In the nasal passages we have two roomy chambers, with a surface area augmented by the convolutions of the turbinates : from this large surface, normally constantly moist, it is estimated that one litre of water is evaporated every 24 hours. It is reasonable to assume that it is one of the functions of the nasal chambers thus to act as an auxiliary to the heat-regulating centre. Through these moist chambers a current of air is constantly passing. The evaporation resulting therefrom must be considerable, and as a consequence the temperature-lowering effects on the nasal mucous membrane produced by this constant evaporation must likewise be quite considerable. The cooled blood from the nasal chambers entering the general circulation must in its turn help to lower the general body temperature.

Emergency Heat Regulation.

Under normal conditions the loss of heat to the body resulting from the nasal evaporation is adjusted through the heat-regulating centre, as all other bodily heat losses are, by heat production through metabolic changes. But when too sudden a demand is made on the heat-regulating mechanism, it cannot be balanced immediately by heat production. Nature, then, has recourse to another expedient, and that is, by stopping as soon as possible all the heat leakages which are generally going on in the body. As an example of this may be cited the contraction of the skin vessels on exposure to cold. Loss of heat through the nasal chambers may be eliminated in two ways :

(*a*) *By acting on the cooling medium* ; turning off, so to speak, the tap of the chamber containing the cooled blood by retarding the rate of its inflow into the general circulation.

(*b*) *By acting on the cooling agent* ; diminishing the air current passing through the nasal chambers.

These two actions are accomplished by the heat-regulating centre in two ways. The nasal mucous membrane has a large vaso-motor nerve-supply as well as very numerous nets of blood-vessels. By sudden vaso-motor paresis a marked stasis and congestion of the nasal mucous membrane takes place. The rate of flow of cooled blood into the general circulation is thus greatly retarded. The stasis and congestion produce at the same time a definite swelling of the erectile mucous membrane of the inferior and middle turbinates and of the anterior part of the septum. The air-way is diminished, with the result that the volume of air that can pass, the evaporation and its resulting cooling effects, are all proportionally reduced. Moisture accumulates in the chamber—the cause of the running nose—and this again helps further to diminish the volume of air passing.

In addition to this vaso-motor controlling action, respiration also plays a part in the adjustment of both the cooling agent and the cooling medium. For, on exposing the body to the effects of cold the breath is held, respiration is first temporarily inhibited, and if the exposure to the cold is continued, respiration becomes shallow. This, too, has a double effect. The volume of air passing through the nasal passages is further lessened, while the suction action of inspiration on the nasal circulation is diminished. Hence, the congestion of the nasal mucous membrane is still more favoured. The importance of this suction action is demonstrated by the ease with which a partial blockage of the nose is often overcome by a few deep inspirations.

Response of Defensive Nature.

In this view a common cold is primarily a physiological process, a local response of a defensive nature to a sudden physiological demand. It is only afterwards, when congestion and stasis have been established, when warm moist air—now almost stationary—fills the nasal cavities, that microbic growth contributes its quota to the aggravation of the trouble.

Since this sudden application by the heat-regulating centre of the vaso-motor and respiratory brakes, in order to stop the heat leakages through the nasal chambers, must interfere with the normal functions of the nose, it stands to reason that Nature would make use of this method only as an emergency measure : under certain contingencies which would arise for instance :—

(*a*) When the heat-regulating centre itself is faulty. This is the case in very young children whose mechanism, compared with that of an adult, functions imperfectly. For, while an adult's temperature generally remains constant irrespective of the temperature by which he is surrounded, that of a child fluctuates to some degree in accordance with the variations in temperature of the bodies with which it comes in contact. This imperfect working of the heat-regulating mechanism in the child accounts for the susceptibility of children to catarrh of the upper air-passages.

(*b*) When the auxiliaries to the heat-regulating centre do not act well—e.g., when the skin through too much protection of warm clothing has not been allowed to react quickly to sudden changes in temperature. Thus people who are apt to coddle catch cold easily, while soldiers and those who lead an open life do not.

(*c*) When the heat-regulating centre has to act precipitately, as on sudden exposure to a draught, or during sudden temperature changes as in spring and autumn.

Prophylaxis.

The better the heat-regulating centre is functioning, and the more responsive are its auxiliaries—the skin and vaso-motor nerves—the less occasion would arise under sudden strain for panicky action and its product, the "common cold." It would therefore seem that the prevention of the onset of common colds can best be achieved by training and developing the auxiliaries of the heat-regulating centre to respond quickly to altered temperature conditions. Children ought to be hardened from infancy, cold sponging should follow the daily tepid bath, older children should have a cold shower. Children should not be overburdened with too much clothing. Finally, breathing exercises relieve and overcome nasal congestion, the suction action of deep inspiration improving the circulation and the tone of the nasal mucous membrane.

MENTAL HOSPITALS IN THE EAST.

THE recently published "Triennial Reports for the Mental Hospitals of Assam, Burma, and the Punjab," covering the period 1921–23, reveal closely similar conditions in lunacy administration in these three States. The most important change is a slow but steady increase in the numbers of certified insane. Whether this be due to the more efficient detection of mental disease, or actually to a general increase in the prevalence of insanity, is not suggested. Since the population of mental hospitals is apparently increasing all over the world, it is of the greatest interest to ascertain whether this indicates an increased ratio of sane to insane among the general population, and if so, upon what factors this change depends. In reports from such distant parts of the world as these, whose conditions it is impossible to visualise for anyone who has not been there, any information, even amounting only to a mere opinion, on this question of universal concern would be of peculiar value.

In consequence of these growing admissions, the mental hospitals of Bengal and Assam have been overcrowded. In the latter place new buildings are projected, a serious feature of the accommodation shortage being that criminal lunatics are being detained for long periods in jail; in Burma a new hospital is actually in progress of erection. In the Punjab a new criminal asylum has been built, and the tuberculous section of the Lahore asylum has been extended. The complete segregation of tuberculous subjects in this asylum is an example which might well be followed in many English institutions; recently the treatment of these patients has included sodium morrhuate injections carried out on a large scale. Lahore is also peculiar in that the female section is entirely staffed by Franciscan nuns. This introduces another point on which a stranger to India might well desire some explanation, and that is the fact that in all these hospitals there are about five times as many males as females. There is general complaint of inadequate information as to past histories, and diagnosis in the absence of any information as to the patient's antecedents is often difficult. The majority are admitted in a poor state of physical health, due most commonly to dysentery or some other form of infective diarrhœa, to tuberculosis, or *Cannabis indica*. Malaria appears to have its highest incidence in Assam, and ascaris infection is prominent in Burma. There has been a general improvement in administration. Attendants are better paid, and consequently of a more trustworthy type. Patients are better fed, and are allowed much more liberty: a large proportion are employed, both on work for the benefit of the institution, and on large-scale manufacture which brings considerable profits. In one of these reports it is mentioned that patients are paid for their work, this money enabling them to buy such things as sweets and tobacco from the asylum bazaar.

Difficult as it is to picture the conditions under which these patients live and are treated, such impressions as can be gained from these reports are particularly encouraging, and certainly reflect favourably on the Indian administration.

PUBLIC HEALTH IN TOGOLAND.

IN the report for the year 1923 on the British sphere of the mandated territory of Togoland it is explained that this was a German colony until August, 1914, when it was surrendered to the combined British and French forces. The territory lies between the Gold Coast and the French colony of Dahomey; its area is approximately 33,000 square miles, with a population estimated to be 1,000,000. A provisional agreement was made partitioning the colony into the British sphere and the French sphere; and the portion of Togoland now mandated to Great Britain is being administered as an integral part of the Gold Coast and its dependencies. In the portion of the report devoted to medical matters, it is stated that the most important disease in the southern area is venereal. It is not an exaggerated statement that one in every five of the population is infected. Out of 1498 patients attending the hospital at Ho during the year this disease accounted for no less than 300. One of the German methods in combating the disease was the recognition of licensed houses in the main centres, where the inhabitants of brothels were compelled to report themselves to the medical officers for examination once a week. This system, however, is repugnant to British ideas and would not be tolerated. The Government fully realise the importance of the matter, and medical officers always advise the natives to report themselves without delay for treatment when suffering in the first stage of the disease. In the northern area venereal disease is practically negligible. The medical officer at Ho writes: "Malaria and helminthiasis are next in importance and are very common, as should be expected. Sleeping sickness has not yet been met with, but leprosy is prevalent, and, I believe, is more common than is generally known. The health of the people, on the whole, is not too bad. If they would only come for treatment at once, instead of giving the medicine man a trial, one would be able to get more satisfactory reports. It is a regrettable fact that we get a very low percentage of our patients in the first stage of their disease. Even then they take their native concoctions as well as European treatment. Satisfactory progress is made in eradicating the disease of yaws, but even in this case, when all the physical signs have disappeared, they consider themselves recovered and the patients are seen no more. In yaws the effect of even a single injection of salvarsan is very spectacular, and the patient is fully recovered according to his own ideas, and in most cases he is. This, however, makes the native believe that salvarsan is a remedy for all ills; and in cases, for example, of syphilis he will not persist in the treatment for the full course. However, we persevere in the work, in the hope that with time the native will get sufficiently developed mentally to appreciate the fact that he cannot recover from all ills by the same tre ment and in the same space of time." The report that there is a segregation colony for lepers, where patients are housed and treated. This segregation enforced in the town of Yendi, but residence of lepers fr outlying districts is voluntary. The number resident is 2 The treatment of yaws with N.A.B. has practically fr the town of Yendi of the disease, but in spite of acti measures still employed it is very prevalent in the out lying district. Malaria is epidemic and universal, an people of all ages are affected with guinea-worms. Ya and guinea-worms are not only disabling while the disease are active, but cause great deformity afterwards. Thoug the stegomyia and tsetse-fly are common in the district, n cases of yellow fever or sleeping sickness have been dia nosed. Pneumonia and bacillary dysentery are the chi causes of death. The birth-rate is reported to be appro mately 80 to 100 per 1000. Infant mortality is very hi The wife of the officer in charge of the junior trade sch at Yendi is an acting medical officer; she advises the chie of the various towns and villages regarding sanitary improv ments and helps to combat endemic diseases. A num of women emigrate to the coast towns and other big cent for the purpose of prostitution, a profession which appe in their opinion, to involve no degradation, with the resu that they return to this territory infected and spread th venereal disease. The principal causes of prostitution are (*a*) the desire of the women to amass affluence in order to purchase finery; (*b*) in many cases discontent with tl status of wedlock among the labouring classes; (*c*) th lack of specific grounds for divorce, the mere inclination o one of the parties to discontinue the union being sufficient t warrant it being dissolved; and (*d*) the system of nativ legal marriage by which a girl is betrothed at birth, an consequently, in many cases, on arriving at the age of puberty refuses to accept the espoused husband arranged for he and cohabits with a paramour.

SOFT WATER IN THE LONDON AREA.

A CORRESPONDENT asks for advice in finding a residentia locality nearer London than the Wey Valley with an equally soft water-supply. This will not be easy, for Wey Valley water has a total hardness of only 2·8–3°. Woburn Sands with 2·8° has an equally soft water, while at Aylesbury and in parts of Dorking the hardness varies from 4·2–5°. The East Surrey Water Company, which softens its supply to about 4·5°, serves Caterham, Warlingham, and Sanderstead, as well as parts of Reigate, Coulsdon, Epsom, and Woldingham. Further information can be obtained from the very complete Return as to Water Undertakings in England and Wales, issued by the Local Government Board in 1915 (H.M. Stationery Office, 5*s.* 1*d.*). Small water softening plants, specially designed for private houses which will soften most supplies down to 3° or less, are obtainable from the United Water Softeners, Imperial House Kingsway (Permutit process). The original hardness o the water and consequently the locality would then be immaterial to the user.

MIRROR WRITING IN AN ADULT.

To the Editor of THE LANCET.

SIR,—Sixteen years ago you published for me a lette describing the mirror writing of a small boy. I have nov met with a still more remarkable case of the same conditio in a young lady doctor who is left-handed, and whos heredity is markedly so. She has from childhood writte thus, and still writes as fluently backwards or forward at will. This is the first case that I have met in which th mirror writing power has been retained to adult life, bu from inquiry I have found that it is not very uncommo in childhood.

I am, Sir, yours faithfully,

VAUGHAN PENDRED, M.D., F.R.C.S. Eng.

East Sheen, Sept. 20th, 1924.

Messrs. H. K. Lewis and Co.'s monthly list of new book and new editions, added to their medical and scientifi circulating library during August, contains the names o 24 books in the medical list and 14 in the scientific an technical list, in each case covering a wide range of subject

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THE LANCET OF FEB. 2ND, 1924.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for whic subscribers may have no further use. He will be pleased to pay 1*s.* each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

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